NETGEAR®

ReadyDATA OS 1.3

Software Manual

Models:

ReadyDATA 516
ReadyDATA 5200

May 2013
202-11025-07

350 East Plumeria Drive
San Jose, CA 95134
USA

Support

Thank you for purchasing this NETGEAR product.

After installing your device, locate the serial number on the label of your product and use it to register your product at *https://my.netgear.com*. You must register your product before you can use NETGEAR telephone support. NETGEAR recommends registering your product through the NETGEAR web site. For product updates, additional documentation, and support, visit *http://support.netgear.com*.

Phone (US & Canada only): 1-888-NETGEAR.

Phone (Other Countries): Check the list of phone numbers at *http://support.netgear.com/general/contact/default.aspx.*

NETGEAR recommends that you use only the official NETGEAR support resources.

Trademarks

Revision History

Publication Part Number	Version	Publish Month	Comments
202-11025-07	OS 1.3	May 2013	• Updated manual to support ReadyDATA 516.
202-11025-06	OS 1.2	March 2013	• Updated information about File and Folder permissions. (See *Configure the File and Folder Access Settings* on page 89.) • Added information about Smart Snapshot Management for shares and LUNs. (See *Smart Snapshot Management* on page 168.) • Changed name of 'lock period' icon to 'zoom' icon and updated description. For an example of how to use this icon, see *Roll Back to a Snapshot* on page 162.
202-11025-05	OS 1.1	December 2012	• Revised information about cloned shares and LUNs. (See *Manage Snapshots for Shares and LUNs* on page 158.)
202-11025-04	OS 1.1	November 2012	• Moved the chapter about managing disks and volumes ahead of the chapter about configuring the system, network, and global file-sharing protocol settings.
202-11025-03	OS 1.1	September 2012	• Revised *Supported Browsers*. • Added *Optional Uninterruptible Power Supplies*. • Revised multiple screens to remove the Language menu that is now included in the Profile menu. • Removed information about setting up share quotas for users and groups. This information might be added back for a later release. • Where applicable, added a note to explain that without at least one volume, changes are not saved after you reload the ReadyDATA.

202-11025-02	OS 1.1	June 2012	• Revised and added information to *Manage Replication and Recovery between Two or More Systems*. • Added information about share quotas to *View and Change the Properties of a Share*. • Changed the Language selection (see *Select the Language* on page 44).
202-11025-01	OS 1.1	June 2012	First publication.

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Getting Started

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This software manual describes how to configure and manage a ReadyDATA system that runs ReadyDATA OS 1.3 for production storage, backup storage, and disaster recovery.

Because this product is intended for business use, this manual is written for network and data center administrators who are familiar with RAID networking concepts.

This chapter includes the following sections:

Note: For more information about the topics covered in this manual, visit the Support website at *http://support.netgear.com*.

Note: Firmware updates with new features and bug fixes are made available from time-to-time on *downloadcenter.netgear.com*. Some products can regularly check the site and download new firmware, or you can check for and download new firmware manually. If the features or behavior of your product do not match what is described in this guide, you might need to update your firmware.

Note: In this manual, the term *volume* refers to a logical volume with a RAID configuration, and the terms *hard disk drive* and *disk* refer to a physical storage device.

Quick-Start Guide

This manual provides detailed instructions about using your ReadyDATA system, and NETGEAR's recommendations about configuring and managing the system and backing up the data and system configuration.

The ReadyDATA system relies on the following software applications:

- **RAIDar**. A setup utility to locate the ReadyDATA on the LAN and launch Dashboard.
- **Dashboard**. A browser-based interface to configure and manage the ReadyDATA.

To start using the ReadyDATA system quickly, review the following sections and chapters in this order:

1. *Install the ReadyDATA in Your Network* on page 10. Follow the instructions in the installation guide that came with your system and the hardware manual for your system. These documents are available at *www.netgear.com/readydata*. Connect the ReadyDATA to a DHCP server.
2. *Use RAIDar to Discover the ReadyDATA* on page 11. Use RAIDar to locate the ReadyDATA on the network.
3. *Create a Volume and Select the RAID Level* on page 23. Assign the disks to volumes and select the RAID level for each volume. Without at least one volume, changes are not saved after you reload the ReadyDATA. Make sure that you create a volume before you configure any other settings.
4. *Chapter 3, Configure the System Settings*. Configure the basic system components, network settings, and global file-sharing protocols.
5. *Create a Share* on page 70 and *Create a LUN* on page 92. Create shares (NAS data sets) for data transfer and storage over SMB, NFS, AFP, and FTP. Create LUNs (SAN data sets) for data transfer and storage over iSCSI.
6. *Create a User Account* on page 129. Create a user account for each person who should have access to the ReadyDATA, or connect to an external Active Directory.
7. *Set Up Access Rights to Shares* on page 80 and *Assign LUNs to LUN Groups and Manage Access Rights* on page 103. Set the access right for the shares and LUNs.
8. *Manage Snapshots for Shares and LUNs* on page 158. Back up the data that is stored in the shares and LUNs by creating snapshots.

Additional Documentation

NETGEAR maintains a website that supports ReadyDATA products. Visit *www.netgear.com/readydata* for reviews, tutorials, comparison charts, software updates, documentation, an active user forum, and much more.

The following documentation is available at *www.netgear.com/readydata*:

- *Hardware manual*
- *Installation guide*
- *Data sheet*
- White papers

Supported Operating Systems

The ReadyDATA is supported on the following operating systems:

- Microsoft Windows Vista, 7, and 8
- Microsoft Windows Server 2003 R2, all editions, x86 and x64
- Microsoft Windows Server 2008/2008R2 and 2012, all editions, x86 and x64
- Apple Mac OS X 10.5 Leopard or later
- VMware ESX 3.5
- VMware vSphere ESX and ESXi Server 4/4.1
- VMware vSphere ESXi 5.x
- Citrix XenServer 6
- RedHat Enterprise Linux AS 4.7/5.2 or later
- SUSE Linux Server 10.1/10.2 or later, x86 and x64
- Fedora 8 or later
- HP-UX 11
- Solaris 10 or later

Supported Browsers

The ReadyDATA Dashboard supports the following browsers:

- Microsoft Internet Explorer 9.0+
- Apple Safari, 2.0+
- Google Chrome 18+
- Mozilla Firefox 14+
- Opera 9.5+

Note: If you have difficulty accessing the ReadyDATA Dashboard, or if you notice unexpected behavior, try using another browser.

Install the ReadyDATA in Your Network

Install the ReadyDATA as explained in the installation guide that came with your system. LED status information and the boot menu are explained in the hardware manual for your system.

Connect the ReadyDATA to your network, and make sure that a DHCP server can reach the ReadyDATA. By default, the ReadyDATA is configured to receive an IPv4 IP address from a DHCP server.

Note: If the ReadyDATA cannot locate a DHCP server, it is assigned an Auto-IP address through Automatic Private IP Addressing (APIPA). For more information, see *Automatic Private IP Addressing without a DHCP Server* on page 59.

If you want to use the ReadyDATA with an IPv6 address, first access the ReadyDATA through the IPv4 address assigned by the DHCP server, and then configure the IPv6 setting as explained in *Configure the Network Settings* on page 49.

Note: For information about the default system settings, see *Appendix A, Factory Default Settings*.

Note: If an unexpected condition or failure prevents the ReadyDATA from booting after you complete an initial setup procedure, see the LED status information in the hardware manual for your system.

Use RAIDar to Discover the ReadyDATA

RAIDar is a software application that you use to discover ReadyDATA systems on the network. RAIDar is included on the *Resource CD* that came with your system. It includes versions for Windows, Mac, and Linux operating systems. RAIDar is also available at *www.netgear.com/readydata*.

RAIDar displays the discovered ReadyDATA units with their status LED icons. The volume, disk, UPS, and fan LED icons are not operational for the ReadyDATA.

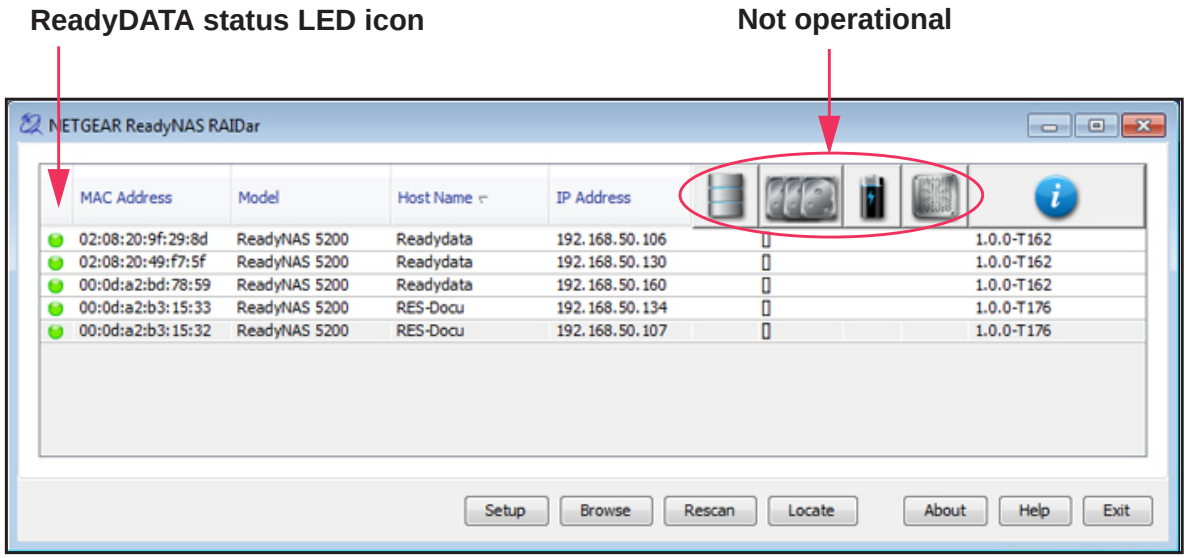


Figure 1.

You can use the following buttons to learn more about the ReadyDATA units on the network:

- **Setup**. Launches Dashboard for the highlighted ReadyDATA.
- **Browse**. Displays the shares available on the highlighted system (LUNs are not displayed). This feature works on a Windows platform only.
- **Rescan**. Updates the list of ReadyDATA systems on the network, and updates the status of each system that is discovered.
- **Locate**. Nonfunctional button.
- **About**. Displays RAIDar information.
- **Help**. Displays the help screen.
- **Exit**. Closes RAIDar.

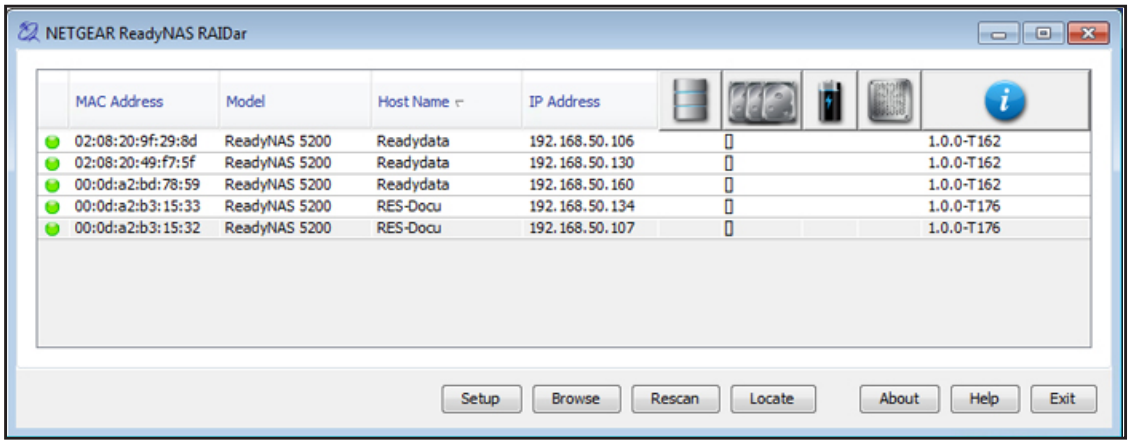
➢ **To discover the ReadyDATA system and launch Dashboard:**

1. Install the appropriate version of RAIDar on a computer that is connected to the same LAN as the ReadyDATA.

   Note: *If you are using Windows XP before SP2, disable the Internet connection firewall.*

2. Launch the RAIDar utility.

   RAIDar displays a screen that lists the systems on the network and provides details about the status of each system it discovers.



   By default, the virtual NICs (VNICs) of the ReadyDATA are DHCP enabled for IPv4, and the RAIDar utility should be able to discover the ReadyDATA.

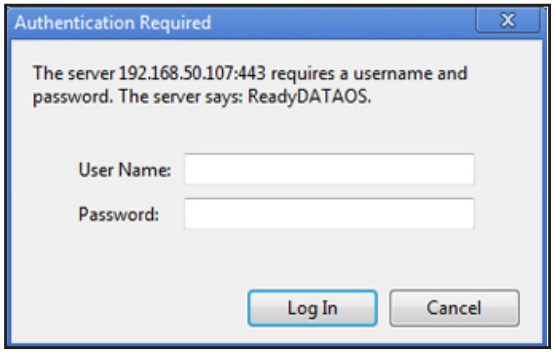
   Note: *The ReadyDATA requires a DHCP server for initial discovery.*

   If the ReadyDATA is not detected, check the following and click **Rescan** to try again:

   - Make sure the ReadyDATA is turned on and is connected to your network.
   - Make sure the client computer that is running RAIDar is on the same subnet as the ReadyDATA.
   - If you are running RAIDar on Windows XP before SP2, disable the Internet connection firewall.

3. Highlight the ReadyDATA and click the **Setup** button.

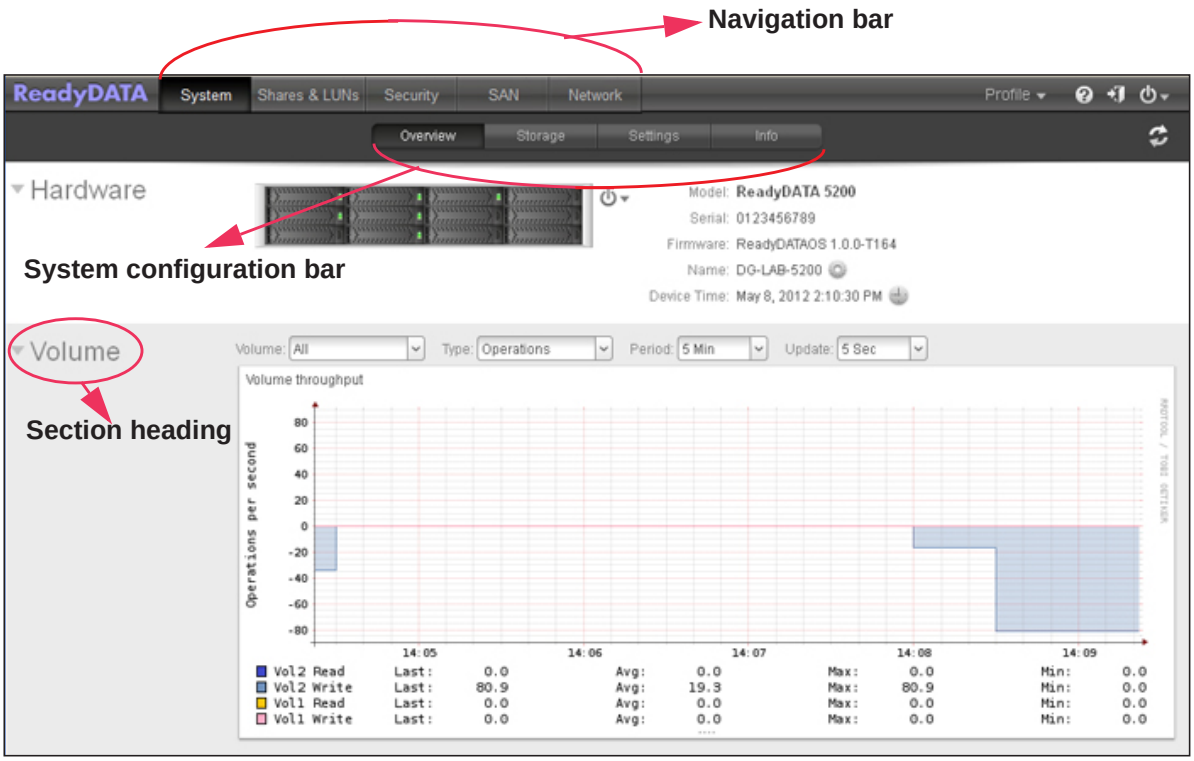
   RAIDar opens your default browser and prompts you to log in to the ReadyDATA.



4. Log in to the ReadyDATA using the default login credentials:
   - As the default user name, enter **admin** (case-sensitive).

- As the default password, enter **password** (case-sensitive).

The Dashboard home screen displays:



The Dashboard has two main bars:

- **Navigation bar**. Located across the top of the screen, the navigation bar helps you navigate through Dashboard. You can also configure the language for the system and the administration password, and access help. To return to the Dashboard home screen, select **System**, or if you are in a system configuration screen, select **Overview**.
- **System configuration bar**. Located below the navigation bar, the system configuration bar helps you to navigate through the four configuration screens that you access from the System menu. To return to the Dashboard home screen, select **Overview**.

Some screens show section headings on the left side. When you select a section heading, settings are displayed that let you configure the ReadyDATA.

The configuration procedures in this manual indicate the selection from the navigation bar, and, if applicable, the selection from the system configuration bar and the section heading on a screen. For example, to configure the global file-sharing protocols, select **System > Settings > Services**. System is the selection from the navigation bar, Settings is the selection from the system configuration bar, and Services is the section heading on the Settings screen.

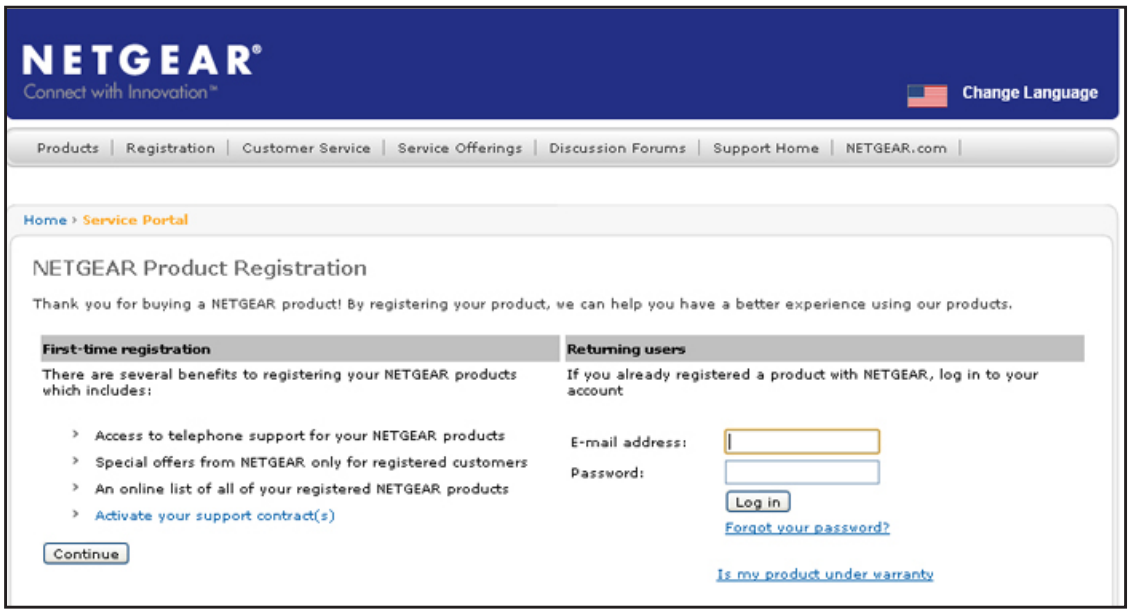
Register the ReadyDATA

You must register your product before you can use NETGEAR telephone support. Register the ReadyDATA by accessing the NETGEAR Product Registration website.

➢ **To register the ReadyDATA:**

1. Locate the serial number on the Dashboard home screen or on the chassis label of your product.
2. Using a browser, visit *http://www.NETGEAR.com/register*.

   The product registration web page displays.



3. Take one of the following actions:
   - If you have never registered a NETGEAR product, click the **Continue** button.
   - If you have registered a NETGEAR product in the past, enter your email address and password and click the **Log in** button.
4. Follow the prompts.

   The ReadyDATA is registered.

2. Manage Disks and Volumes

This chapter describes how to configure the disks and volumes in the ReadyDATA. It contains the following sections:

- *Supported Disks and Initial Startup*
- *About RAID Levels, Volumes, and Disk Representation*
- *Manage Volumes*

Supported Disks and Initial Startup

The ReadyDATA 5200 supports up to 12 disks. With optional expansion disk arrays that can contain either 12 or 24 disks each, you can increase the total number of supported disks to 60. *Figure 2* shows a ReadyDATA 5200 with an optional expansion disk array that supports 24 disks and another array that supports 12 disks.

The ReadyDATA 516 supports up to six disks and does not support expansion disk arrays.

Note: ReadyDATA systems do not recognize non-NETGEAR disks. When you insert a non-NETGEAR disk, Dashboard displays the error message *Disk is not signed by NETGEAR*. ReadyDATA systems recognize only disks that you obtain through NETGEAR or a NETGEAR authorized reseller.

For information about adding and removing disks, see the hardware manual for your system.

Figure 2. ReadyDATA 5200 with optional disk expansion arrays as displayed on Dashboard

The first time that you start your ReadyDATA storage system, you can do so with or without disks installed.

If you start with disks installed, several scenarios are possible, each of which affects the way that the disks are displayed in the graphical enclosure of Dashboard:

- **Disks do not contain data:**
  These disks are made available as unallocated disks.
- **Disks do not contain data that is recognized by the ReadyDATA:**
  These disks are made available as unallocated disks. If you attempt to use these disks for another volume, you are *not* warned of possible data loss.
- **Disks contain a portion of a ReadyDATA volume:**
  These disks are indicated as being part of a nonoperational volume. If you attempt to use these disks for another volume, you are warned of possible data loss.
- **Disks contain a complete volume from a foreign ReadyDATA storage system**:
  - If the disks were imported successfully, the virtual disk LEDs in the graphical enclosure in the Dashboard provide a visual indication.
  - The volume is mounted on the ReadyDATA.
  - Any shares and LUNs on the volume are configurable through Dashboard.
  - Clients can access the shares through the configured file-sharing protocols, but you need to reconfigure the LUN settings (see *Manage Access Rights for LUN Groups* on page 107).

About RAID Levels, Volumes, and Disk Representation

RAID Levels

Redundant array of independent disks (RAID) is a storage technology that balances data protection, system performance, and storage space by determining how the storage system distributes data. Many different ways of distributing data have been standardized into various RAID levels. Each RAID level offers a trade-off of data protection, system performance, and storage space. For example, one RAID level might improve data protection but reduce storage space. Another RAID level might increase storage space but also reduce system performance.

Various RAID combinations provide different levels of protection against data loss, capacity, and speed. The ReadyDATA supports the following RAID levels:

- **RAID 0** (striped disks) distributes data across several disks in a way that gives improved speed and no lost capacity, but all data on all disks is lost if any one disk fails. Although such an array has no actual redundancy, it is customary to call it RAID 0.
- **RAID 1** (mirrored disks) duplicates data across two disks in the array, providing full redundancy. Two disks each store exactly the same data, at the same time, and at all times. Data is not lost as long as one disk survives. Total capacity of the array equals the

capacity of the smallest disk in the array. At any given instant, the contents of both disks in the array are identical.

- **RAID 5** (striped disks with single parity; in a ZFS system also referred to as RAIDz1) combines three or more disks in a way that protects data against loss of any one disk; the storage capacity of the array is reduced by one disk.
- **RAID 6** (striped disks with dual parity; in a ZFS system also referred to as RAIDz2) can recover from the loss of two disks.
- **RAID 10 (or 1+0)** uses both striping and mirroring. “01” or “0+1” is sometimes distinguished from “10” or “1+0”: a striped set of mirrored subsets and a mirrored set of striped subsets are both valid, but distinct, configurations.

A RAID set with redundancy continues to function without interruption when one (or possibly more, depending on the selected RAID level) disks of the array fail, although the array is then vulnerable to further failures. When you replace a bad disk by a new one, the array is rebuilt while the ReadyDATA continues to operate normally. The ReadyDATA supports high availability, allowing you to hot-swap disks without powering down.

Select the RAID level based on the number of disks and protection level that you want to use for the volume:

Table 1. RAID level and required number of disks

RAID Level	Number of Required Disks	Redundancy
RAID 0	1 or more	None
RAID 1	2 only (more disks are not supported in RAID 1)	Supported
RAID 5	3 or more	Supported for 1 disk
RAID 6	4 or more	Supported for 2 disks
RAID 10	4 or more, but an even number	Supported for all disks

Note: Although a RAID system can be used to back up data from other disks or another array, RAID is not meant to be an alternative or substitute for backing up data. Data might become damaged or destroyed without harm to the disk or disks on which it is stored. For example, part of the data might be overwritten by a system malfunction; a file might be damaged or deleted by a user error or malice, and not noticed for days or weeks; and, of course, the entire array is at risk of physical damage.

Volumes

In the most general sense, volumes are data storage devices. Volumes can be either physical or logical. In this manual, the term *volume* refers to a logical volume with a RAID set, and the terms *hard disk drive*, *disk*, and *physical volume* refer to a physical storage device.

The ReadyDATA treats disks and volumes in the following ways:

- Each logical volume can correspond to one disk.
- A logical volume can be made up of more than one disk.
- You cannot divide a single disk among two or more volumes.
- Although you can install different types of disks within the ReadyDATA, you can select only disks of the same physical performance characteristics to be members of one volume. For example, you *cannot* mix nearline SATA 7,200 rpm disks with the following disks within one volume:
  - SAS 7,200 rpm disks
  - SAS 10,000 rpm disks
  - SAS 15,000 rpm disks
  - SSDs

After you create a volume (see *Create a Volume and Select the RAID Level* on page 23), you can make the following changes to the volume:

- Expand the volume by adding more disks (see *Expand a Volume* on page 29)
- Attach write cache and read cache SSD disks to boost the performance of volumes that contain slower disks such as SATA 7,200 rpm or nearline SAS 7,200 rpm disks (see *Configure Write and Read Boost Disks to Improve Performance* on page 32)
- Export the volume (see *Export and Import a Volume* on page 35)
- Delete the volume (see *Delete a Volume* on page 36)

You can configure any disk that is not allocated to a volume as a hot spare for *any* volume in case of failure (see *Configure Global Spare Disks* on page 38). Because the hot spare provides only a temporary solution, it can be of any physical performance characteristics, that is, it does not need to match the physical performance characteristics of the disks in the volumes.

Optional Expansion Disk Arrays and Volumes

You can create a volume that spans more than one enclosure by using one or more optional expansion disk arrays (EDA2000 and EDA4000).

The number of volumes that you can create within a ReadyDATA is limited only by the total number of disks in the ReadyDATA and expansion disk arrays. With several expansion disk arrays, the ReadyDATA supports up to 60 disks and volumes.

Note: When you span a volume across several enclosures, the volume is dependent on the availability of all enclosures. If one enclosure fails, the entire volume goes offline.

Graphical Enclosure and Color Coding of the Disks Onscreen

The physical disks that are installed in the ReadyDATA and optional expansion disk arrays are represented in a graphical enclosure onscreen:

Figure 3. ReadyDATA with optional disk expansion arrays as displayed on Dashboard.

The disks in the graphical enclosure are color coded. The meaning of the colors is explained in the following table:

Table 2. Disk color codes

Sample	Color	Description
	Black	Not assigned to a volume. Available for selection.
	Gray	Assigned to a volume. Not available for selection.
	Gray, no label	The disk is not signed by NETGEAR. Not available for use with ReadyDATA.
	Blue	Member of the displayed volume.
	Yellow	Write boost disk for the displayed volume.

Table 2. Disk color codes (continued)

Sample	Color	Description
	Orange	Read boost disk for the displayed volume.
	Green	Assigned as a global spare disk.

The status LED icon on a disk (which is located at the right side) can be off, green, or red:

- **Off**. Indicates that the status of the disk is unknown (for example, see the black and gray disks in the previous table).
- **Green**. Indicates that the disk is online (for example, see the blue, yellow, orange, and green disks in the previous table).
- **Red**  . Indicates that the disk is bad or faulty.

For more information about disk status and disk health, see *Disk Status and Health Information* on page 146 and the hardware manual.

RAID and Volume Implementation

The ReadyDATA supports a new, proprietary RAID architecture that is both flexible and easy to administer. This new architecture is based on the Zettabyte File System (ZFS), allowing you to configure different RAID levels for different volumes on the same platform.

Volume and RAID level are tied together on the ReadyDATA:

- You can select the RAID level for a volume only when you create the volume. After you create a volume, you cannot change the RAID level.
- When you create a volume, you select the disks that participate in the RAID set. You can select from the following RAID levels: RAID 0, RAID 1, RAID 5, RAID 6, or RAID 10. You *can* add additional disks to a volume, but in the process of doing so, you cannot change the RAID level. A single exception exists: When you expand a RAID 1 volume, the RAID level is automatically upgraded to RAID 10.

RAID levels are indicated onscreen as follows:

- **New RAID sets**. A new RAID set is indicated with a plus sign: RAID 0+, RAID 1+, RAID 5+, and RAID 6+. The exception is RAID 10, which is indicated with a plus sign and a zero: RAID 1+0.
- **Expanded RAID sets**:
  - An expanded RAID 0 set is indicated in the same way as a new RAID set: RAID 0+.
  - An expanded RAID 1 set is indicated with a plus sign and a zero, and becomes in fact a RAID 10 set: RAID 1+0.
  - An expanded RAID 5 and RAID 6 set is indicated with a plus sign, a zero, and an expansion sequence number that indicates the number of RAID groups that have been added:
    - RAID 5+0, nx
    - RAID 6+0, nx

For example, a RAID 6 set that has been expanded twice by the addition of two RAID groups goes from RAID 6+ to RAID 6+0, 2x, and then to RAID 6+0, 3x.

- An expanded RAID 10 set is indicated in the same way as a new RAID 10 set: RAID 1+0.

The following table explains the RAID nomenclature. The sequential expansion number is indicated by n, and x just indicates *times* (for example, 2x is two times).

Table 3. RAID nomenclature on the ReadyDATA

RAID Level	New RAID	Expanded RAID
RAID 0	RAID 0+	RAID 0+
RAID 1	RAID 1+	RAID 1+0, nx
RAID 5	RAID 5+	RAID 5+0, nx
RAID 6	RAID 6+	RAID 6+0, nx
RAID 10	RAID 1+0	RAID 1+0

Manage Volumes

Note: After you make a change on the Storage screen, you might need to click the Refresh button ( ) to update the display.

Create a Volume and Select the RAID Level

➢ **To create a volume and select the RAID level:**

1. Select **System > Storage**.

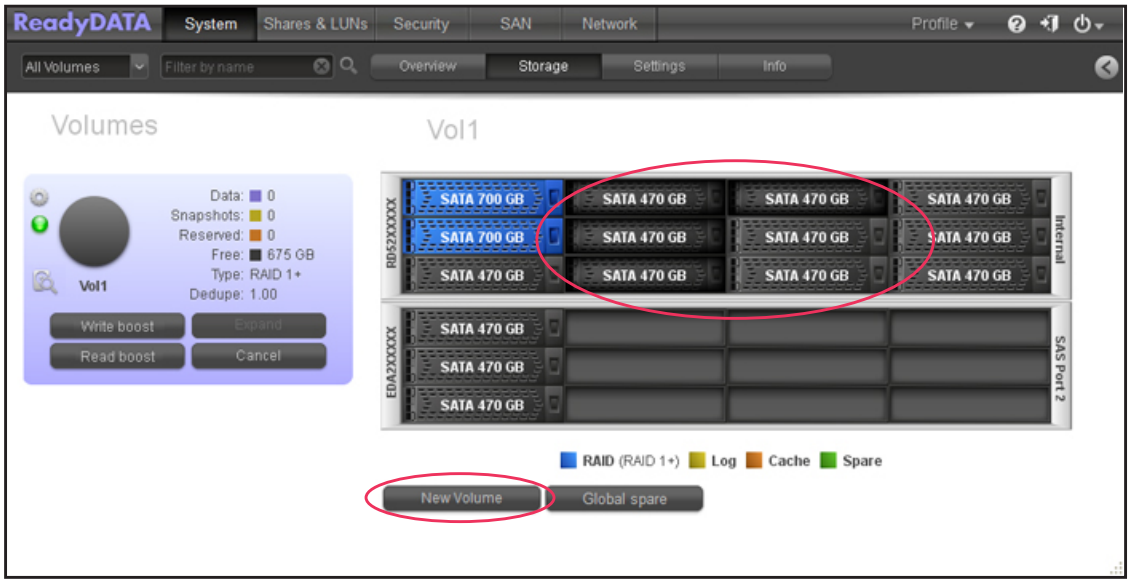
   The Storage screen displays.

   The following figure shows one optional expansion disk array and one volume. A new system does not have any volumes.

2. In the enclosure, click the disks that you want to select as members of the volume.

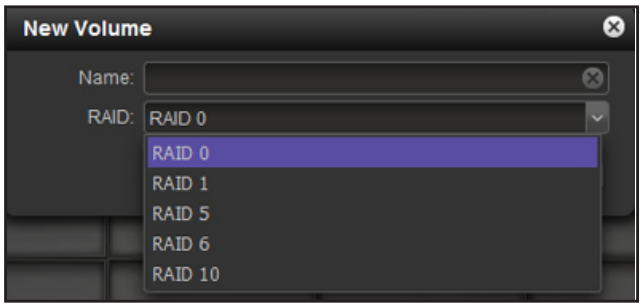
   You can select disks with a black color coding only. If you have an expansion disk array, you can select disks from both the ReadyDATA and the expansion disk array.

   The selected disks are highlighted and all volume buttons become available, including the New Volume button under the enclosure:



3. Below the enclosure, click **New Volume**.

   The New Volume pop-up screen displays:



   The RAID levels that are displayed depend on the number of disks that you selected.

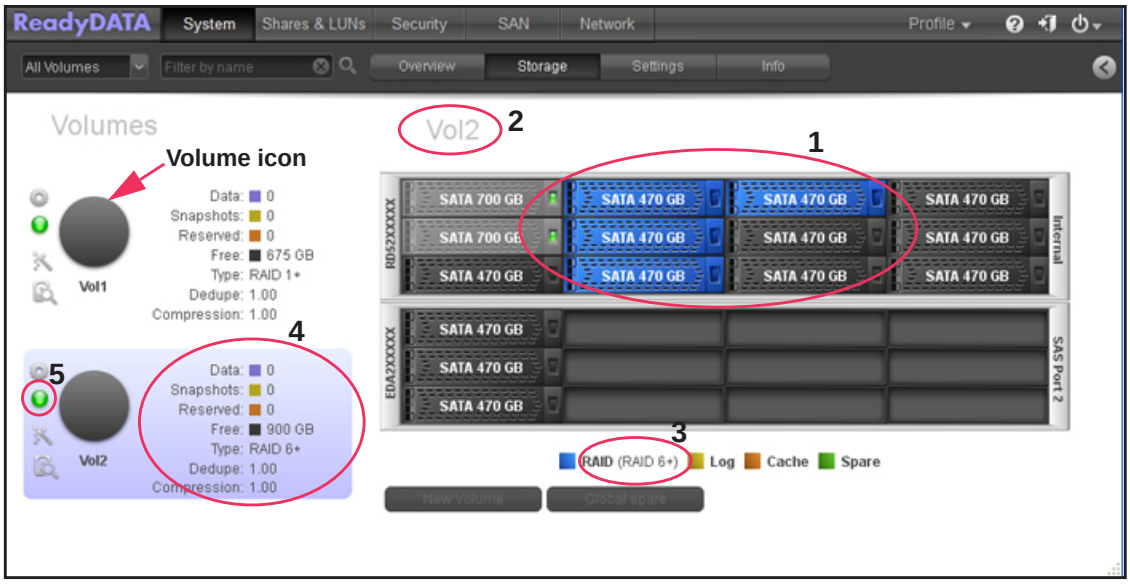
4. Configure the following settings:
   - **Name**. Enter a name for the volume. The volume name must begin with a letter, and can contain only alphanumeric characters, underscores (_), hyphens (-), periods (.), and colons (:). The volume names *mirror*, *logs*, and *spare* are reserved and cannot be used, as are all names that begin with the *c[0–9]* pattern. However, you can use names that begin with the *C[a–z0–9]* or *c[a–z]* pattern.

- **RAID**. From the drop-down list, select the RAID level. The RAID level that you can select depends on the number of disks that you selected in *Step 2*. For more information, see *Table 1* on page 18.

5. Click **Create**.

   The volume is created.

6. To the left of the enclosure, click the new volume and note the following:
   - The color of the selected disks in the enclosure turns blue (**1**).
   - The name of the new volume displays above the enclosure (**2**).
   - The selected RAID level for the new volume displays below the enclosure (**3**).
   - Information about the new volume displays to the left of the enclosure (**4**).
   - The virtual LED indicates the health status of the volume (**5**).



Information about the volume displays to the left of the enclosure, and is explained in the following table. The color coding refers to the colors in the volume icon (that is, the circle) and the information that is displayed to the right of it. The volume icons are black in the previous figure but can display colored slices).

Item	Description	Color Coding
Information to the right of the volume icon		
Data	The volume storage space that is consumed by data in MB, GB, or TB.	Purple
Snapshots	The number of snapshots that have been taken.	Green
Reserved	The volume storage space that is reserved in MB, GB, or TB.	Orange
Free	The volume storage space that is available in MB, GB, or TB.	Black or gray
Type	The configured RAID level.	Not applicable

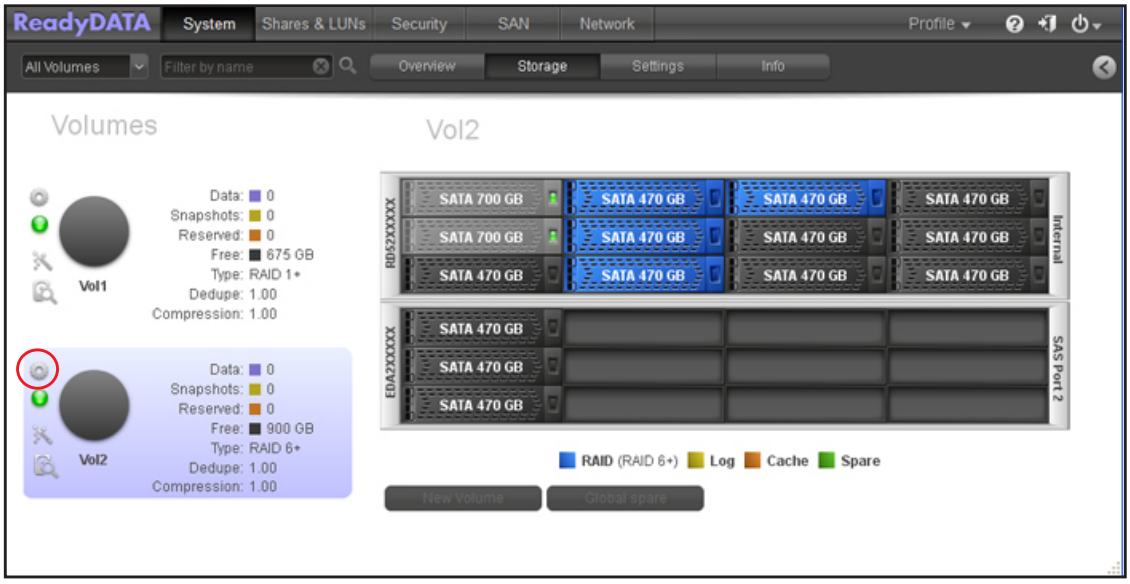
Item	Description	Color Coding
Dedupe	By default, dedupe is 1.00, indicating that deduplication is enabled and that the initial deduplication ratio is set. A number higher than 1.00 indicates that data has been deduplicated and that the deduplication ratio has increased. The deduplication ratio is the data capacity of the volume divided by its usable storage capacity. **Note:** You cannot disable deduplication on a volume, but you can do so on a share or LUN that resides on the volume.	Not applicable
Compression	By default, compression is 0.00, indicating that compression is enabled but that data has not yet been compressed. A number higher than 0.00 indicates the number of times that data has been compressed. For example, 5.00 indicates that data has been compressed five times.	Not applicable
Virtual health LED to the left of the volume icon		
Green	The volume is healthy.	
Yellow	The volume is degraded. **Note:** Even though the health LED might be yellow and not red, the volume might actually be bad or faulty if the number in the Free field (to the right of the volume icon) is a strange or negative number and if the numbers in the Data, Snapshots, and Reserved fields (also to the right of the volume icon) are zero.	
Red	The volume is bad or faulty.	

View the Properties of a Volume

➢ **To view the properties of a volume:**

1. Select **System > Storage**.

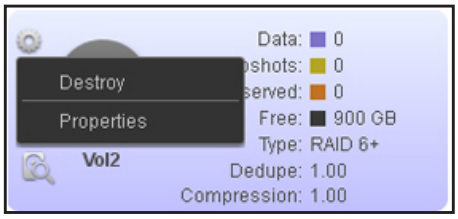
   The Storage screen displays.



2. To the left of the graphical enclosure, click the volume that you want to explore.
3. Click the gear icon.

   A pop-up menu displays (see the figure in *Step 4*).

4. Select **Properties**.

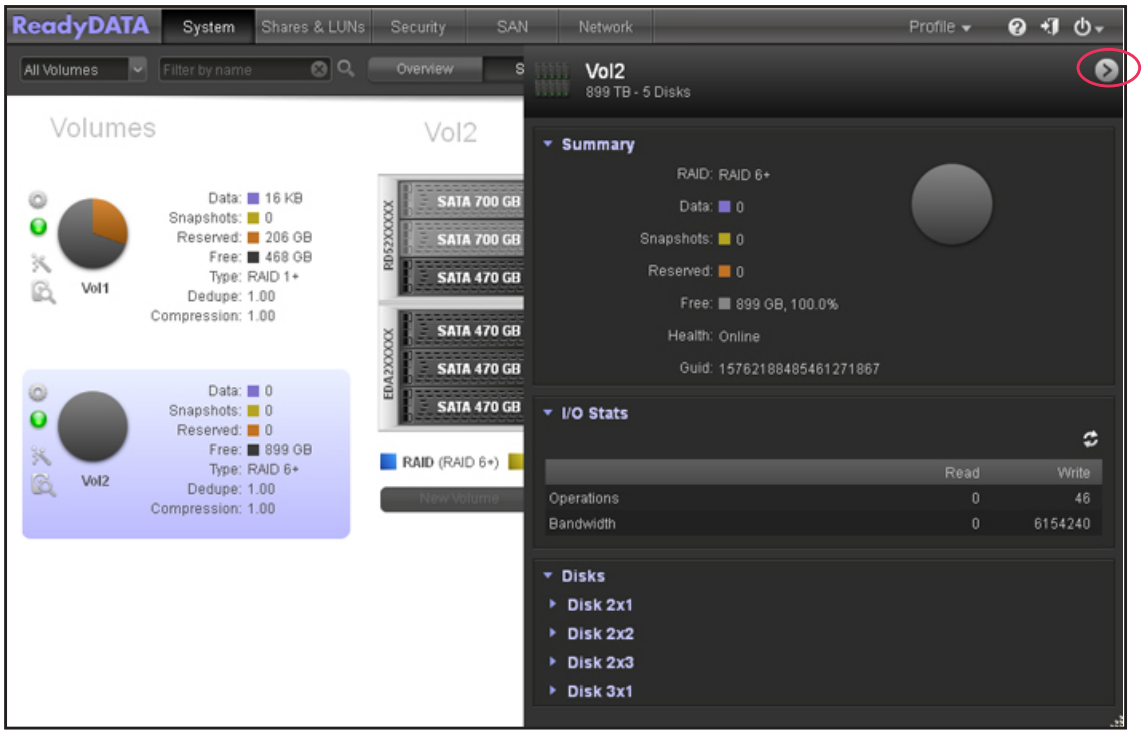


   The properties of the volume display at the right side of the screen in the Summary section (see the figure in *Step 7*).

5. (Optional) Click **I/O Stats**.

   I/O statistics display.

6. (Optional) Click **Disks.**
7. Status and health information about the disks that are members of the volume displays.



Note: You can also use a shortcut to display the properties of a volume. Click the screen **Expand** button ( ) on the top right of the screen to display the properties (see the red oval in the previous figure). Click the same button (which now shows a reversed arrow) again to hide the properties (see the red oval in the previous figure).

The following table explains the properties:

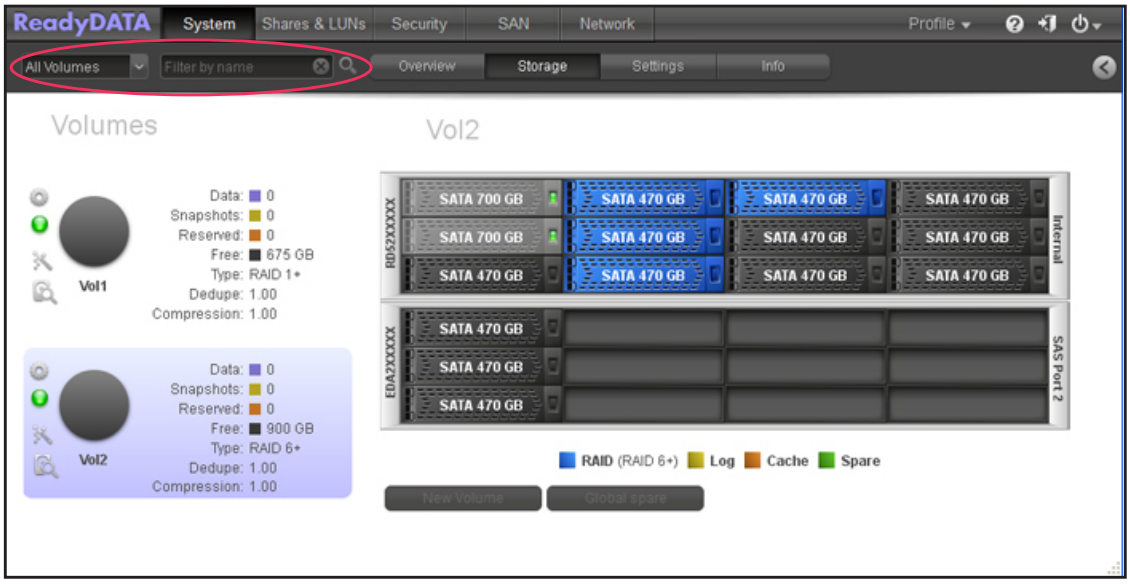
Item	Description
Summary	
RAID	The configured RAID level.
Data	The storage space that is consumed by data in MB, GB, or TB.
Snapshots	The number of snapshots that have been taken.
Reserved	The storage space that is reserved in MB, GB, or TB.
Free	The storage space that is available in MB, GB, or TB and in a percentage.
Health	The health of the volume. The options are: • **Online**. The volume is healthy. • **Degraded**. The volume is degraded.

Item	Description
Guid	The globally unique identifier (GUID) for the volume. The GUID allows you to use the volume GUID path, for example, “\\?\Volume{17303906860048588325}\”.
I/O Stats	
Operations	The number of read operations and the number of write operations on the volume.
Bandwidth	The volume bandwidth throughput in bytes.
Disks	
For information about health and status information that is displayed for each disk that is member of the volume, see *Disk Status and Health Information* on page 146.	

Search for a Volume

1. Select **System > Storage**.

   The Storage screen displays.



2. Below the navigation bar, select your search criteria in one of the following ways:
   - From the All Volumes drop-down list, select a volume.
   - In the Filter by name field, enter a volume name (you can enter the initial letters of the name). If needed, to the right of the field, click the magnifier glass button to search for the volume.

Expand a Volume

You can expand an existing volume in two ways:

- **Horizontal expansion**. Expand the volume by adding more disks to the volume.

- **Vertical expansion**. Expand the volume by replacing all disks in the volume with higher-capacity disks.

Expansion is immediate, independent of the amount of stored data on the volume, and does not affect users. You cannot change the RAID level during the expansion. The only exception is a horizontal expansion of a volume with RAID 1, which becomes RAID 10.

Horizontal Expansion

Horizontal expansion requires that you add the correct number of disks for the selected RAID level, and that the disks are of the same physical performance level (disk type, speed, and size). For example, you can expand an existing volume that consists of four disks in a RAID 6 set by adding four more disks.

The following table explains the minimum number of disks required to expand a volume horizontally:

Table 4. Disks required for horizontal volume expansion

RAID Level	Number of Disks Required for Expansion
RAID 0	Any.
RAID 1	Even number. RAID level automatically upgrades to RAID 10.
RAID 5	3 or a multiple of 3.
RAID 6	4 or a multiple of 4.
RAID 10	4 or more, but an even number.

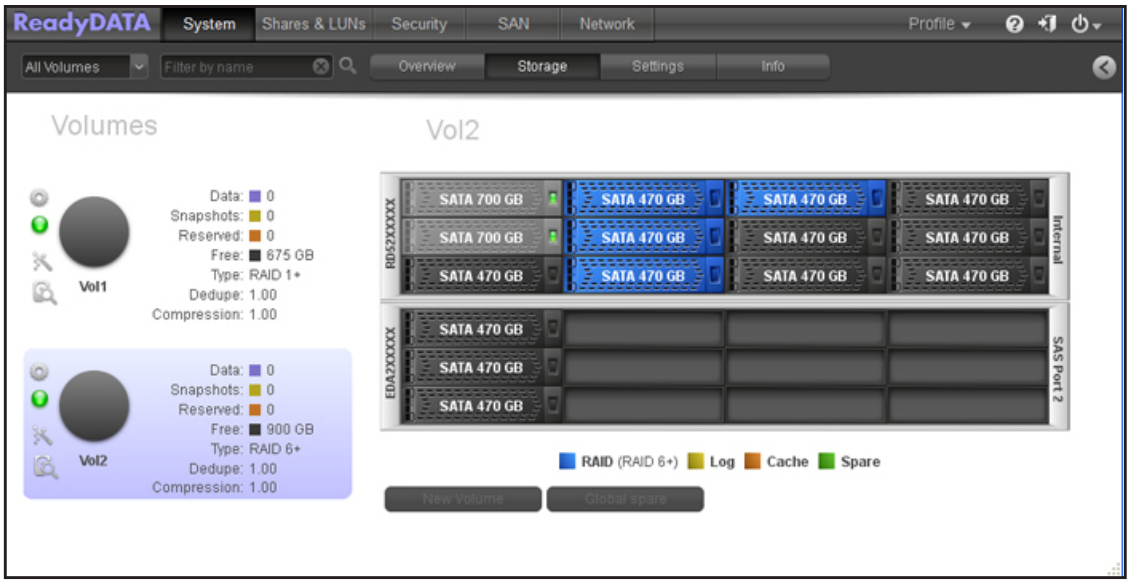
➢ **To expand an existing volume horizontally:**

1. Add the required number of disks to your storage system as indicated in *Table 4*.

   For more information about how to add a disk to your system, see the hardware manual for your system, which is available at *www.netgear.com/readydata*.

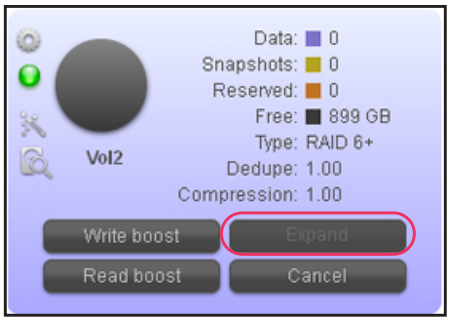
2. Select **System > Storage**.

   The Storage screen displays.



3. To the left of the graphical enclosure, click the volume that you want to expand.
4. In the enclosure, click the disk or disks that you want to add to the volume.

   You can select disks with a black color coding only. The selected disk or disks are highlighted, and to the left of the enclosure, the Expand button displays:



   Note: *The Expand button becomes available only if you select a sufficient number of disks for the configured RAID level of the volume.*

5. Click **Expand**.

   A pop-up screen displays, asking you to confirm the expansion.

6. Click **Yes**.

   The volume is expanded, and updated information about the volume displays to the left of the enclosure.

Vertical Expansion

To vertically expand a volume, you must replace *all* disks in the volume with larger-capacity disks of the same physical performance level (disk type and speed). You can vertically expand volumes with RAID 1, RAID 5, RAID 6, or RAID 10.

For example, you can expand an existing volume in a RAID 6 set that consists of four 500 GB SATA 7,200 rpm disks by replacing all four disks with 750 GB SATA 7,200 rpm disks.

➢ **To vertically expand a volume:**

1. Replace one disk in the volume with a larger-capacity disk.

   For more information about how to add a disk to your system, see the hardware manual for your system, which is available at *www.netgear.com/readydata*.

   Note: You must use supported disks in your ReadyNAS system. For more information, see *Supported Disks and Initial Startup* on page 16.

2. Wait for the volume to resync your data.

   You can continue to use your ReadyNAS system while the volume is resyncing. Resyncing can take several hours. The start and completion of the resyncing process is recorded in the system log (see *System Logs* on page 147).

If you set up email notifications for your system, you receive an email message when the process finishes. For more information about alert notifications, see *Configure System Alerts* on page 46.

3. Repeat *Step 1*-*Step 2* until you have replaced each disk in the volume with a larger-capacity disk.

Configure Write and Read Boost Disks to Improve Performance

To enhance the performance of an existing volume and improve I/O operations, you can add one or more high-performance disks such as SSDs to unload write (log) or read (cache) operations, or both. You can easily remove write and read disks from a volume. For write and read operations, you would not need to select disks with very large storage capacities.

You can attach both write and read disks to a volume:

- **Write boost**. Assign one or more separate write disks to improve the write performance of the array. NETGEAR recommends that you use SSDs that are optimized for writing.
- **Read boost**. Assign one or more separate cache disks to accelerate read operations in the array. NETGEAR recommends that you use SSDs that are optimized for reading.

Note: For more information about performance, see the white paper *Performance Considerations for Configuring the ReadyDATA* that is available from the ReadyDATA website at *www.netgear.com/readydata*.

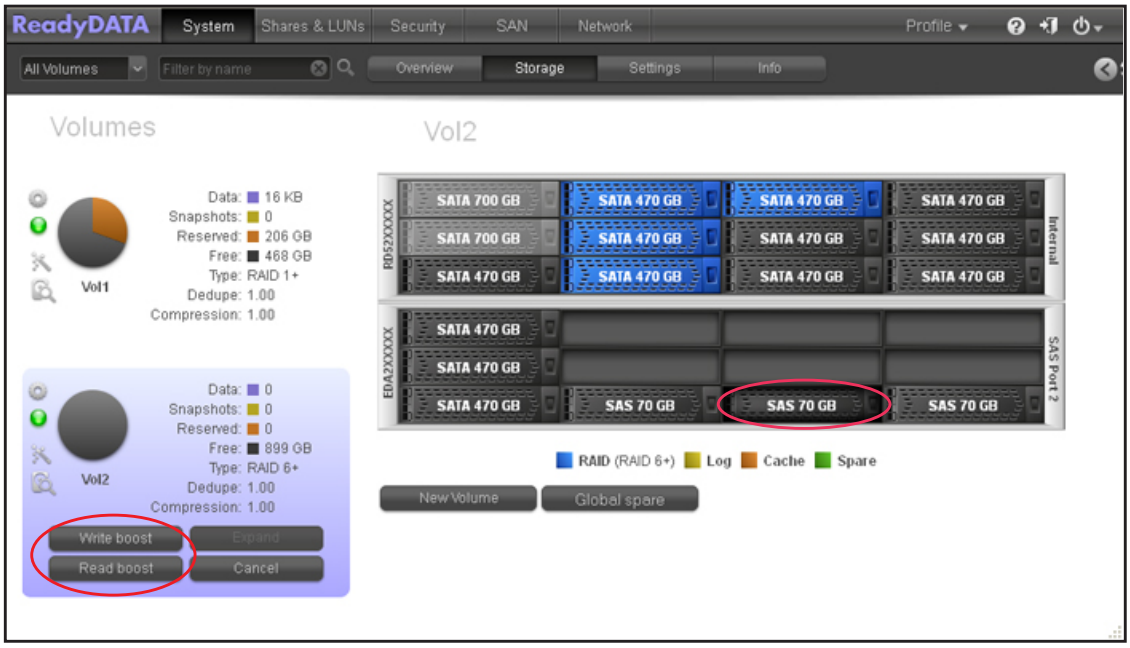
➢ **To attach a write or read boost disk to an existing volume:**

1. Select **System > Storage**.

   The Storage screen displays (see the figure in *Step 3*).

2. To the left of the graphical enclosure, click the volume that you want to expand.
3. In the enclosure, click the disk or disks that you want to configure as write or read disks for the volume.

   You can select disks with a black color coding only. The selected disk or disks are highlighted, and to the left of the enclosure, the Attach log and Attach cache buttons display:



Note: *The previous figure shows SAS disks that are used as write boost and read boost disks. However, you would normally use SSDs for such purposes.*

4. Perform one of the following actions:
   - Click **Write boost**. The selected disk or disks are assigned to the volume for write operations. The color of the selected log disks in the enclosure turns yellow:

     (You would normally use an SSD as a write boost disk.)

- Click **Read boost**. The selected disk or disks are assigned to the volume for read operations. The color of the selected cache disks in the enclosure turns orange:

  (You would normally use an SSD as a read boost disk.)

Updated information about the volume displays to the left of the enclosure.

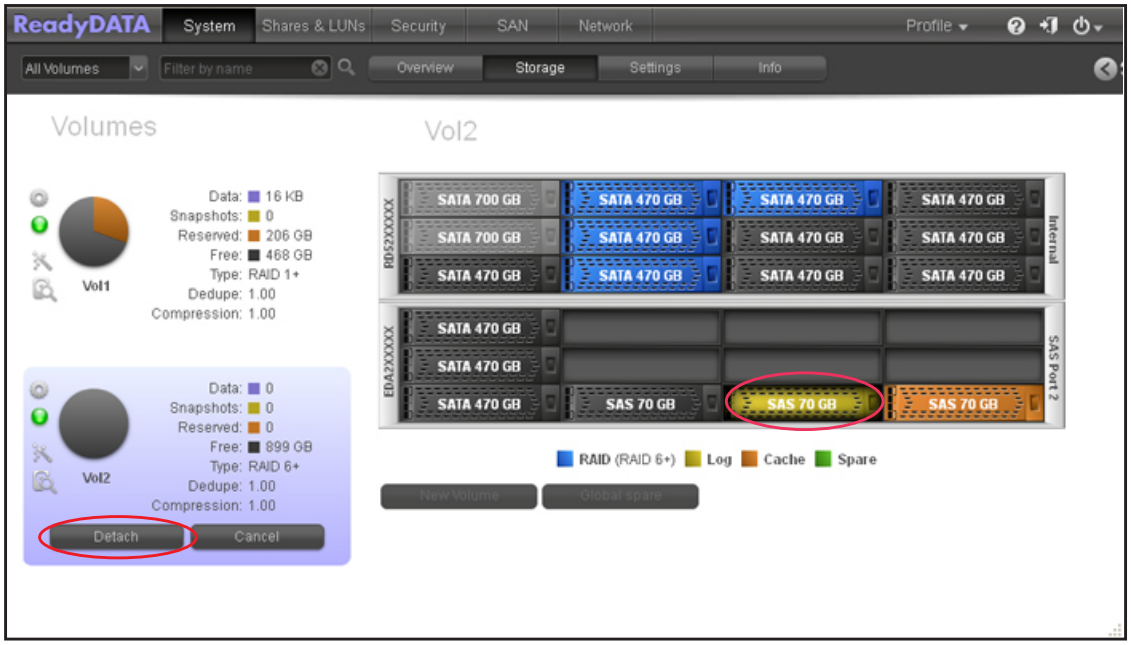
➢ **To detach a write or read boost disk from a volume:**

1. Select **System > Storage**.

   The Storage screen displays (see the figure in *Step 3*).

2. To the left of the graphical enclosure, click the volume from which you want to remove write or read disks.
3. Perform one or both of the following actions in the enclosure:
   - Click the write boost disk or disks that you want to remove from the volume. You can select disks with a yellow color coding only.
   - Click the read boost disk or disks that you want to remove from the volume. You can select disks with an orange color coding only.

   The selected disk or disks are highlighted, and to the left of the enclosure, the Detach button displays:



Note: *The previous figure shows SAS disks that are used as write boost and read boost disks. However, you would normally use SSDs for such purposes.*

4. Click **Detach**.

Updated information about the volume displays to the left of the enclosure. A detached write or read disk becomes available again for other purposes (the color of the disk turns black).

Export and Import a Volume

The ReadyDATA lets you export an existing volume by exporting the disks on which the volume resides. You can physically insert the disks in other slots of the chassis, in an optional expansion disk array, or in another ReadyDATA that runs the same firmware version.

The share names and all share data, the LUN names and all LUN data, and all snapshots on the shares and LUNs are migrated to the new location, but you need to redefine the following settings:

- **For shares**: User permissions if an Active Directory is not integrated.
- **For LUNs**: iSCSI targets and initiator permissions.

Other than a minimal downtime during the export and import process, users are not affected, provided that you redefine these settings.

➢ **To export a volume:**

1. Select **System > Storage**.

   The Storage screen displays.

2. To the left of the graphical enclosure, click the volume that you want to export.
3. Click the **Export** button ( ).

   Note: *The Export button is not displayed when the ReadyDATA has a single volume only. There need to be at least two volumes.*

4. Confirm your action.

   In the graphical enclosure, the slots with the disks that are marked for export are now shown with question mark icons.

5. Remove the disks from the physical enclosure.

➢ **To import a volume:**

1. Insert all disks on which the volume resides in the slots of a ReadyDATA or optional expansion disk array.

   The following occurs:

   - If the disks are imported successfully, the color of the imported disks in the enclosure turns blue.

   - The volume is mounted on the ReadyDATA.

2. If an Active Directory is not integrated, reconfigure user permissions for shares.

   See *Configure the Network Access Settings* on page 84.

3. Reconfigure iSCSI targets and initiator permissions for LUNs.

   See *Assign a LUN to a LUN Group* on page 103 and *Manage Access Rights for LUN Groups* on page 107.

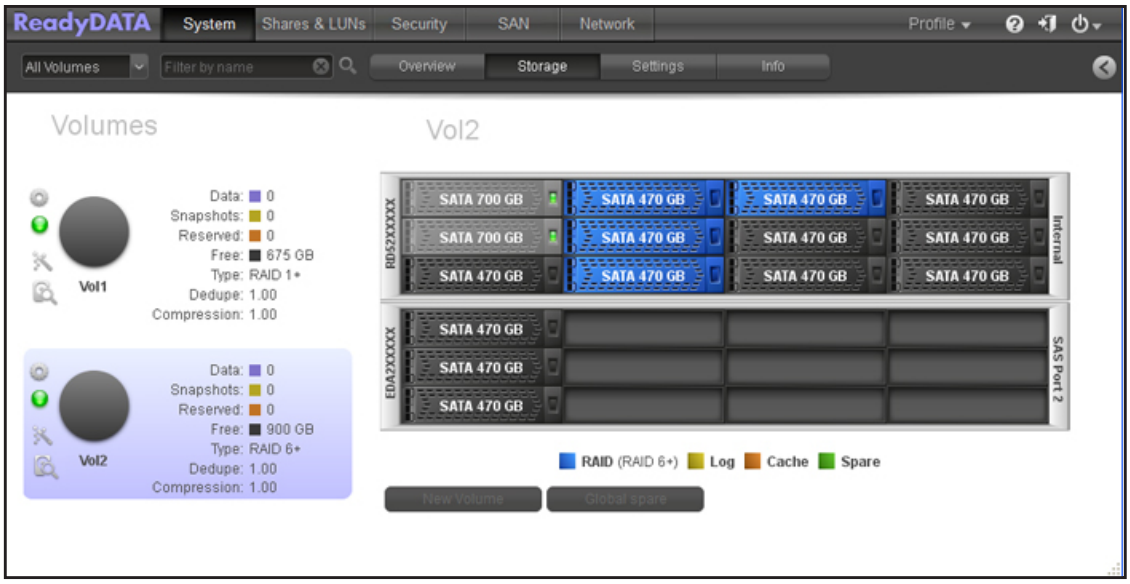
Delete a Volume

Before you delete a volume, migrate the data (shares and LUNs) to another volume or another storage device (see *Migrate a Share to Another Volume* on page 77 and *Migrate a LUN to Another Volume* on page 100).

➢ **To delete a volume:**

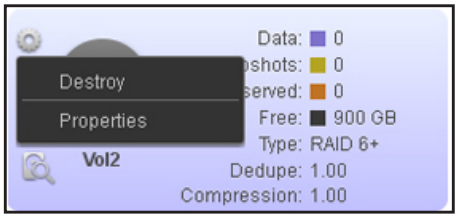
1. Select **System > Storage**.

   The Storage screen displays.



2. To the left of the graphical enclosure, click the volume that you want to delete.
3. Click the gear icon.

   A pop-up menu displays.



4. Select **Destroy**.

   A pop-up screen displays.

   Note: *The Destroy option is not available when the ReadyDATA has a single volume only. The Destroy option is available if you have at least two volumes.*

5. Type **DESTROY** (all capital letters) in the field of the screen to confirm your decision.
6. Click **Yes**.

   The volume is deleted.

   The disks that were part of the volume become available again for other purposes (the color of the disks turns black).

Scrub a Volume

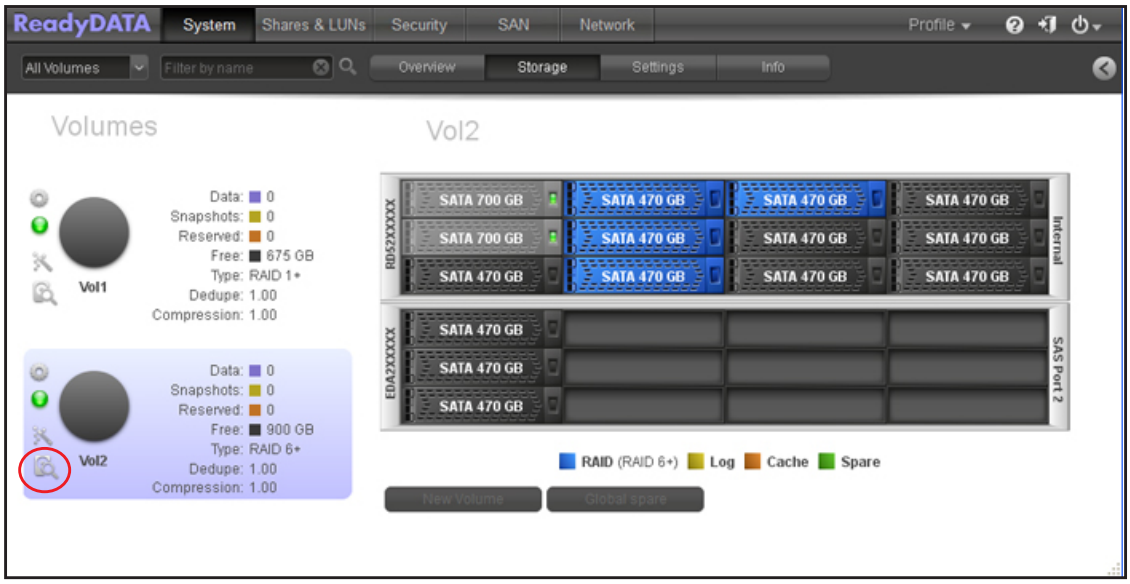
Scrubbing cleans and validates all data on a volume and checks the volume for errors. No data is deleted, and shares, LUNs, and snapshots on the volume remain intact.

Note: Scrubbing is not an erase function.

➢ **To scrub a volume:**

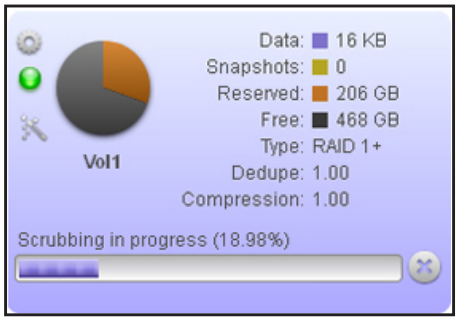
1. Select **System > Storage**.

   The Storage screen displays.



2. To the left of the graphical enclosure, click the volume that you want to scrub.
3. Click the scrub button ( ).

   Scrubbing starts, and the progress is shown in a progress bar. To stop scrubbing while in it is progress, click **X** to the right of the progress bar.



Configure Global Spare Disks

A global spare disk is a redundant disk that can automatically take the place of a failed disk in any volume. A failed disk and a spare disk taking over do not need to have the same physical

performance characteristics because the replacement is temporary, similar to using a spare tire on a car with a flat tire that needs to be repaired.

IMPORTANT:

Having a spare disk takes over after a failure is a temporary solution; replace the failed disk as soon as possible.

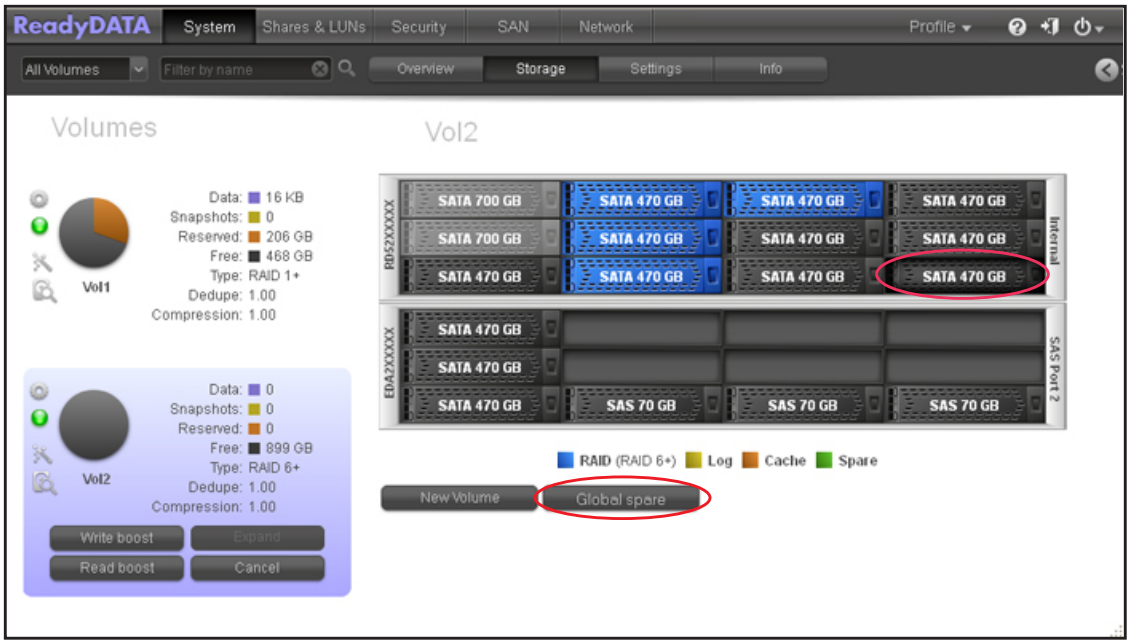
➢ **To create a global spare disk:**

1. Select **System > Storage**.

   The Storage screen displays (see the figure in *Step 2*).

2. In the graphical enclosure, click the disk or disks that you want to assign as global spare disks.

   You can select disks with a black color coding only. The selected disks are highlighted and all volume buttons become available, including the Global spare button under the enclosure:



3. Click **Global spare**.

   The color of the selected disk or disks in the enclosure turns green:

   The disk or disks are now available as global spare disks.

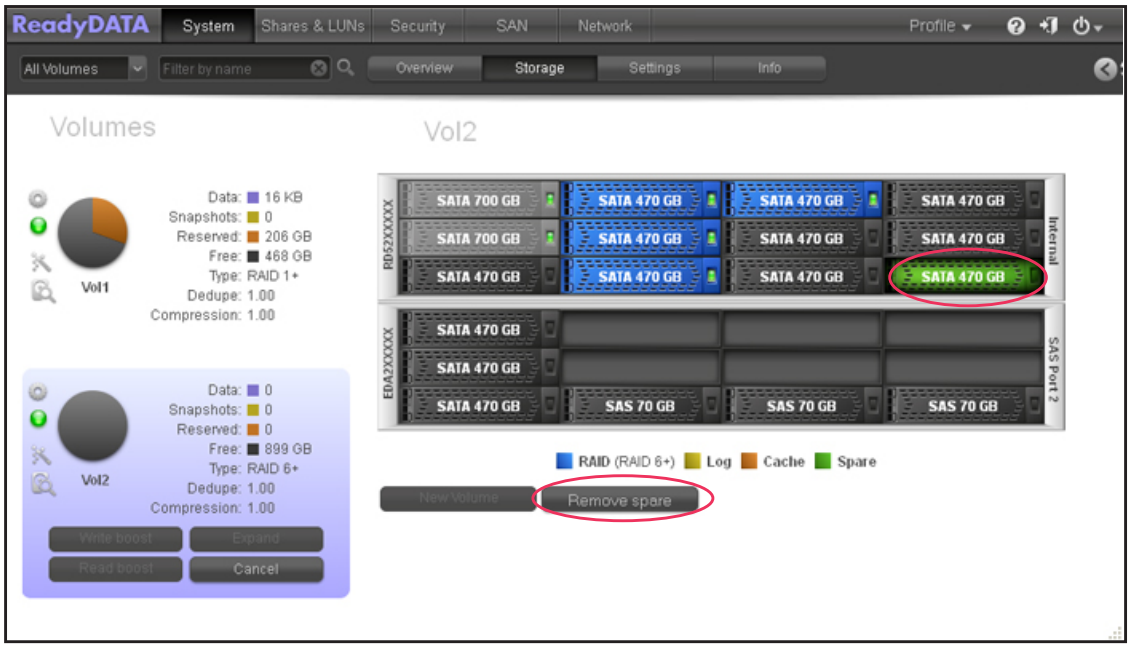
➢ **To remove a global spare disk:**

1. Select **System > Storage**.

The Storage screen displays (see the figure in *Step 2*).

2. In the graphical enclosure, click the global spare disk or disks that you want to remove.

   You can select disks with a green color coding only. The selected disks are highlighted and the Remove spare button under the enclosure becomes available:



3. Click **Remove spare**.

   The removed spare disk or disks become available again for other purposes (the color of the disks turns black).

Configure the System Settings

3

This chapter describes how to configure the basic settings of the ReadyDATA. It contains the following sections:

- *Customize the Basic System Components*
- *Configure the Network Settings*
- *Configure Global File-Sharing Protocols*

> **Note:** Without at least one volume, changes are not saved after you reload the ReadyDATA. Make sure that you create a volume before you configure the system, network, and global file-sharing protocol settings, and before you update the firmware. For information about how to configure volumes, see *Chapter 2, Manage Disks and Volumes*.

Customize the Basic System Components

NETGEAR recommends that you configure the basic system components that are described in the following sections before you use the ReadyDATA:

- *Set the Clock*
- *Select the Language*
- *Set the Administrator Password*
- *Configure System Alerts*
- *Configure the Host Name*
- *Set the Theme*

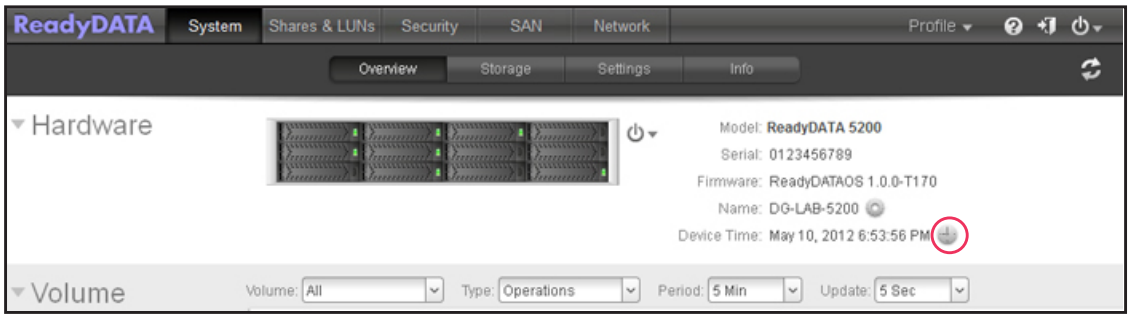
Set the Clock

To enable the ReadyDATA to time-stamp files correctly, ensure that the time and date settings are accurate.

➢ **To set system time and date:**

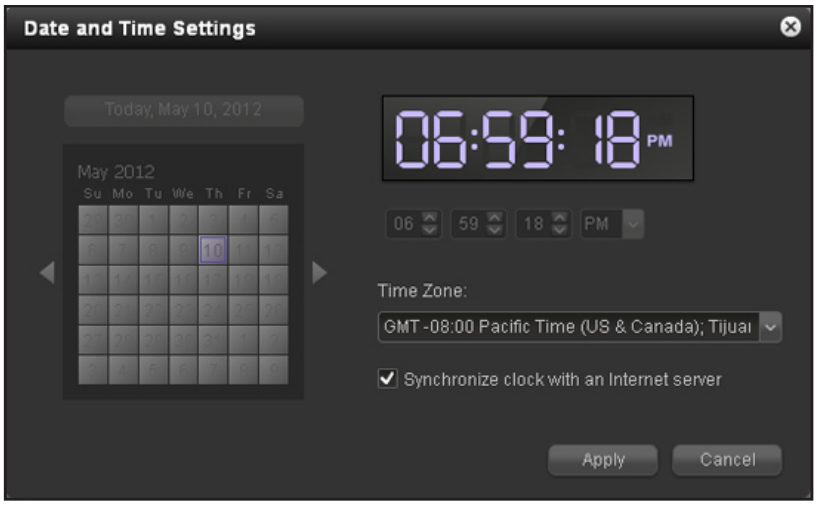
1. Select **System > Overview > Hardware**.

   The Dashboard home screen displays the system information:



2. To the right of the Device Time field with the date and time, click the clock icon.

   The Date and Time Settings screen displays:



3. From the Time Zone drop-down list, select the correct time zone for your location.

   So that your files are correctly time-stamped, NETGEAR recommends that you select the time zone in which the ReadyDATA is physically located.

4. Select the correct date and time by doing one of the following:
   - Select the **Synchronize clock with an Internet server** check box. When you select this check box, the calendar and time drop-down lists dim, and the system's date and time are synchronized with a NETGEAR NTP server.
   - Clear the **Synchronize clock with an Internet server** check box, and use the calendar and time drop-down lists to set the date and time manually.

5. Click **Apply**.

   If you change the time zone, you need to restart the ReadyDATA, as follows:

   a. Click the **Power** icon in the upper right corner of the navigation bar:

   b. From the drop-down list, select **Restart**.

   c. Confirm your selection.

      The ReadyDATA shuts down gracefully and then restarts.

      If you enabled email alerts, the ReadyDATA sends a message after it restarts.

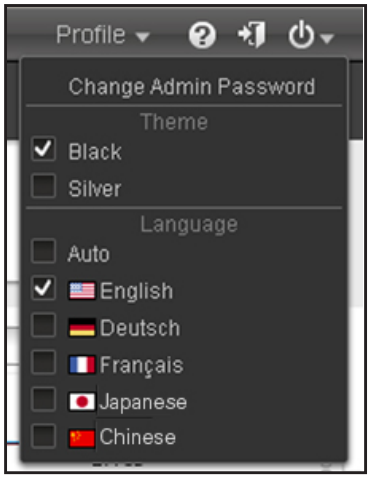
Select the Language

To make sure that the ReadyDATA correctly displays file names, configure the system to use the appropriate character set. For example, selecting Japanese allows the ReadyDATA to support files with Japanese names in Windows Explorer.

➢ **To configure language settings:**

1. On the navigation bar, at the right, click **Profile**.

   The Profile menu displays:



2. In the Language section, specify a language by selecting a check box, or select the **Auto** check box, which enables the ReadyDATA to set the language automatically to the one that is used by the browser.

   After you change the language, Dashboard restarts.

Note: NETGEAR recommends selecting a language based on the region in which you use the ReadyDATA.

Set the Administrator Password

It is important to safeguard the administrator password and to change it regularly to protect your data.

Choose an administrator password that is different from the default password and keep it in a safe place. Anyone who obtains this password can change settings or erase data that is stored on the ReadyDATA.

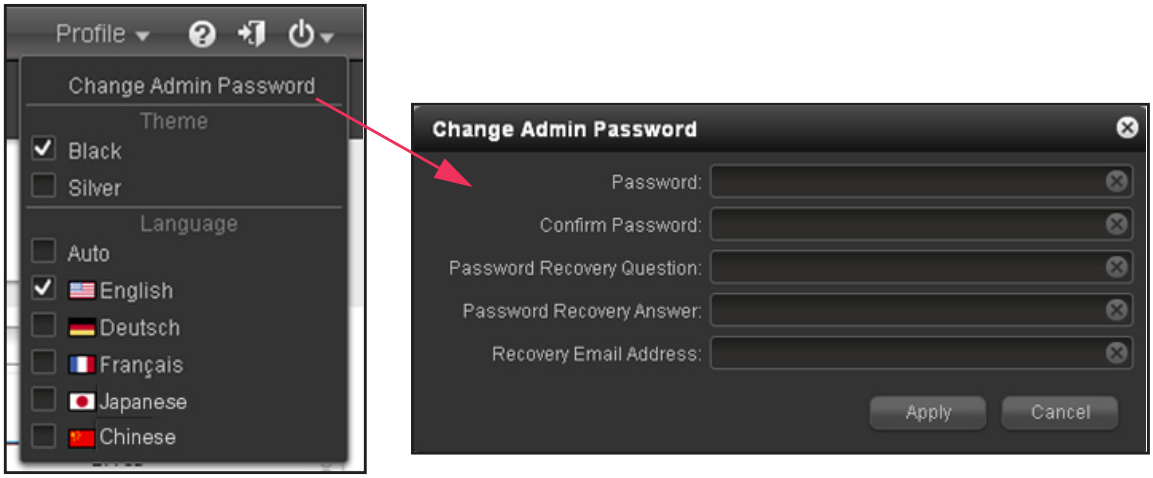
➢ **To change the administrator password:**

1. On the navigation bar, at the right, select **Profile**.

   The Profile menu displays (see the figure in *Step 2*).

2. Select **Change Admin Password**.

   The Change Admin Password pop-up screen displays:



3. Configure the settings as explained in the following table:

Item	Description	
Password	Enter a new administrator password.	
Confirm Password	Reenter the new password.	
Password Recovery Question	Choose a question that few people can answer. For example, you might enter *First dog's name*? or *Best friend in Kindergarten*? as your password recovery question.	Complete these fields to be able to recover a lost or forgotten administrator password with NETGEAR's password recovery tool (see *Recover the Administrator Password Using NETGEAR's Password Recovery Tool* on page 141).
Password Recovery Answer	Enter the answer to the question you provided in the Password Recovery	
Recovery Email Address	Enter the email address to which you want a reset password to be sent.	

4. Click **Apply**.

Configure System Alerts

If you provide an email address for alert notices, system events such as disk errors and failures, changes in network connectivity, power supply failures, fan speed irregularities and fan failures, and CPU and enclosure temperature violations generate email alert messages. The ReadyDATA divides system events into two categories, mandatory and optional. Mandatory events always generate email alert messages. You can control which optional system events generate email alert messages.

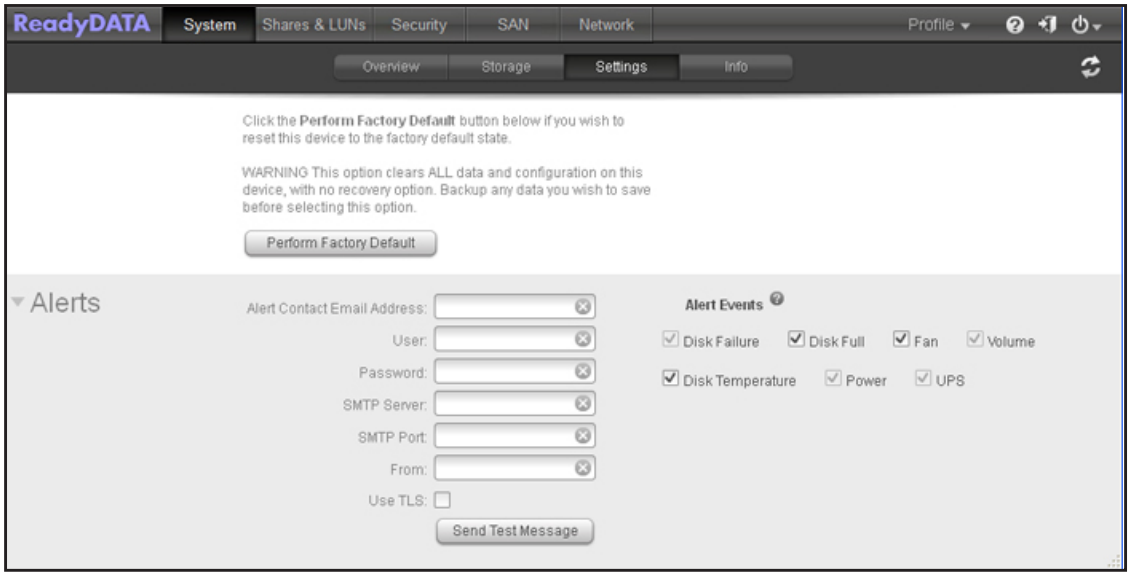
Email Alert Contacts

To receive an email message alerting you if a system event that requires your attention occurs, provide an email address for alert messages. You can use an email address that is accessible from a smartphone to help you monitor the ReadyDATA when you are away from it.

➢ **To manage alert email contacts:**

1. Select **System > Settings > Alerts**.

   The Settings screen displays the alerts settings:



2. Configure the settings as explained in the following table:

Item	Description
Alert Contact Email Address	Enter an email address. You can also edit an existing alert contact or delete it by clearing the field.
User	Enter the user name that is associated with the email address.
Password	Enter the password that is associated with the email address.
SMTP Server	Enter the address of the outgoing SMTP server.

Item	Description
SMTP Port	Enter the port number for the outgoing SMTP server.
From	Enter a name that identifies the sender of the email alert.
Use TLS	Select this check box to use email encryption over TLS.

The storage system uses these credentials to authenticate with the outgoing mail server so that it can send email alerts.

3. (Optional) To determine if you configured the contact information correctly, click the **Send Test Message** button.

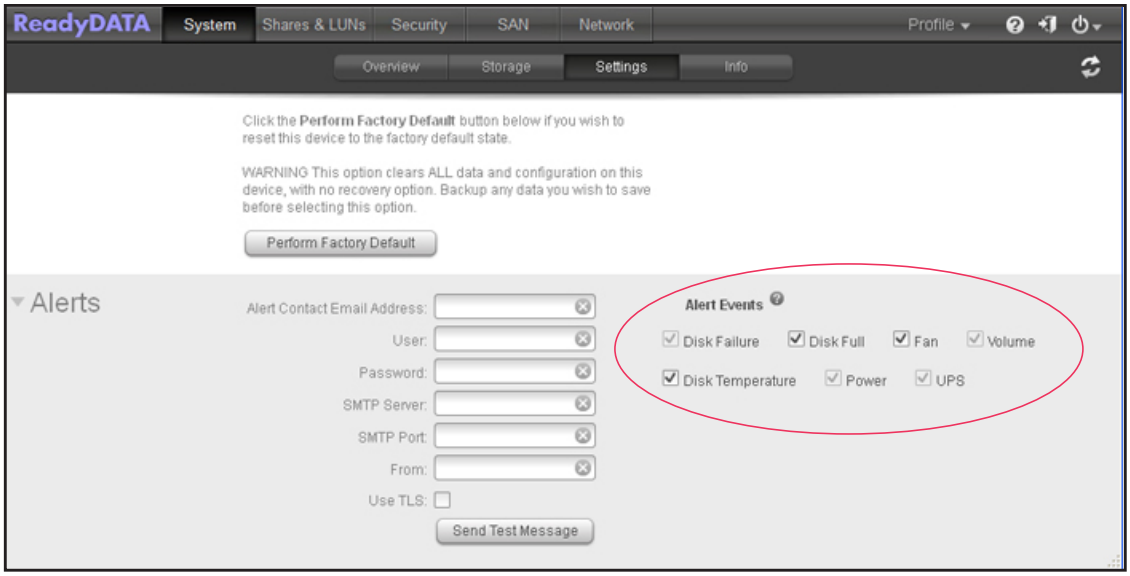
Alert Event Settings

The ReadyDATA is preconfigured to generate email alert messages when system events occur. You can determine which optional system events generate alerts. NETGEAR recommends that you keep all alerts enabled; however, if you are aware of a problem, you could disable an alert temporarily.

➢ **To manage alert event settings:**

1. Select **System > Settings > Alerts**.

   The Settings screen displays the alerts settings:



2. In the Alert Events section, select or clear any event check boxes.

   You can clear any nondimmed events (Disk Full, Fan, and Disk Temperature).

   Dimmed events (Disk Failure, Volume, Power, and UPS) always trigger email alerts.

3. Click **Apply**.

Configure the Host Name

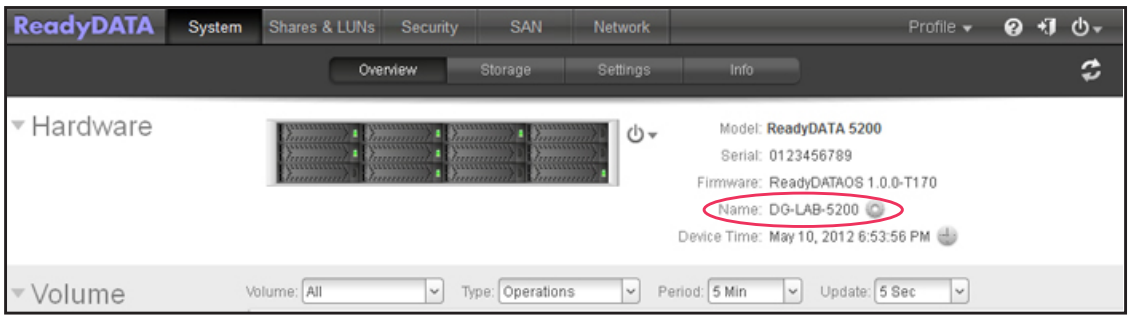
The ReadyDATA uses a host name to advertise itself on the network. When you review the network using RAIDar, a computer, or any other interface, you can recognize the ReadyDATA by its host name.

The default host name is RES- followed by the last six bytes of the system's primary MAC address. You can change the host name to one that is easier to remember and recognize.

➢ **To change the host name:**

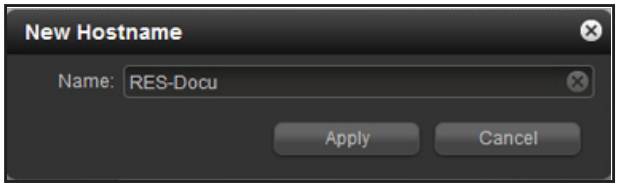
1. Select **System > Overview > Hardware**.

   The Dashboard home screen displays the system information:



2. Click the gear icon to the right of the Name field.

   The New Hostname pop-up screen displays:



3. In the Name field, enter a new host name.

   The host name can have a maximum of 14 characters in most non-Asian languages. If you use Asian language characters, the limit is lower.

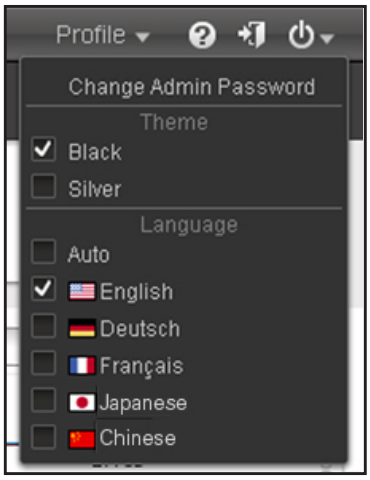
4. Click **Apply**.

Set the Theme

Changing the Dashboard theme is optional.

➢ **To change Dashboard theme:**

1. On the navigation bar, at the right, select **Profile**.
2. In the Theme section, select either the **Black** check box (which is the default selection) or the **Silver** check box.



The Dashboard display adjusts according to your selection.

Configure the Network Settings

- *Configure the Physical Ethernet Interfaces*
- *Configure the Virtual Network Interface Cards*
- *Automatic Private IP Addressing without a DHCP Server*
- *Configure Channel Bonding*

The ReadyDATA provides two physical 1-Gb Ethernet interfaces and two physical 10-Gb Ethernet interfaces. The Ethernet interfaces can be used independently as individual interfaces or combined in a channel-bonded configuration using LACP and hash types 2 through 4. Channel bonding provides redundancy or increased throughput.

You can create and attach virtual NICs (VNICs) to individual and bonded interfaces. The primary benefit of virtual networking is that it allows the ReadyDATA to service many separate networks and to control how much bandwidth is used for each storage-related task.

For each VNIC, you can configure the following settings:

- VLAN membership
- Bandwidth limits
- IPv4 or IPv6 settings
- DNS servers

The following figure illustrates the use of VNICs in a ReadyDATA network configuration. (Throttle refers to the bandwidth limit.)

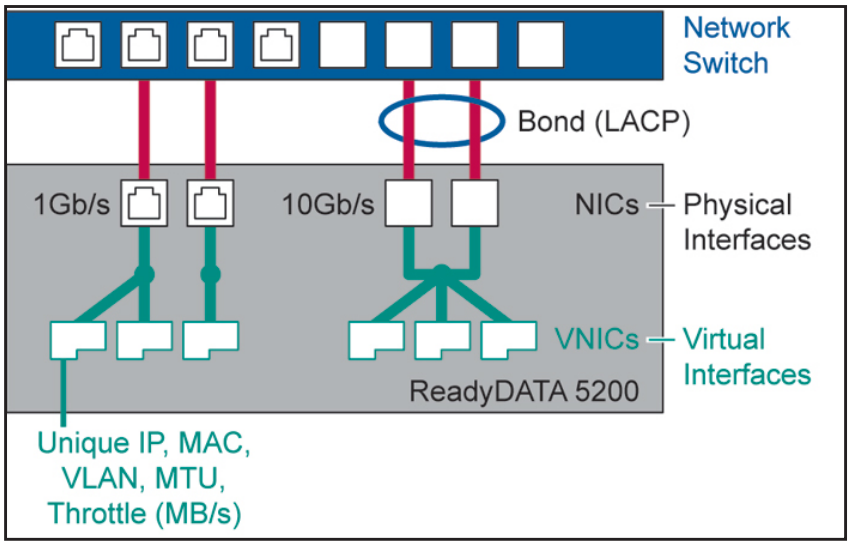


Figure 4.

These are the default network settings before any configuration has occurred:

Table 5. Default network settings

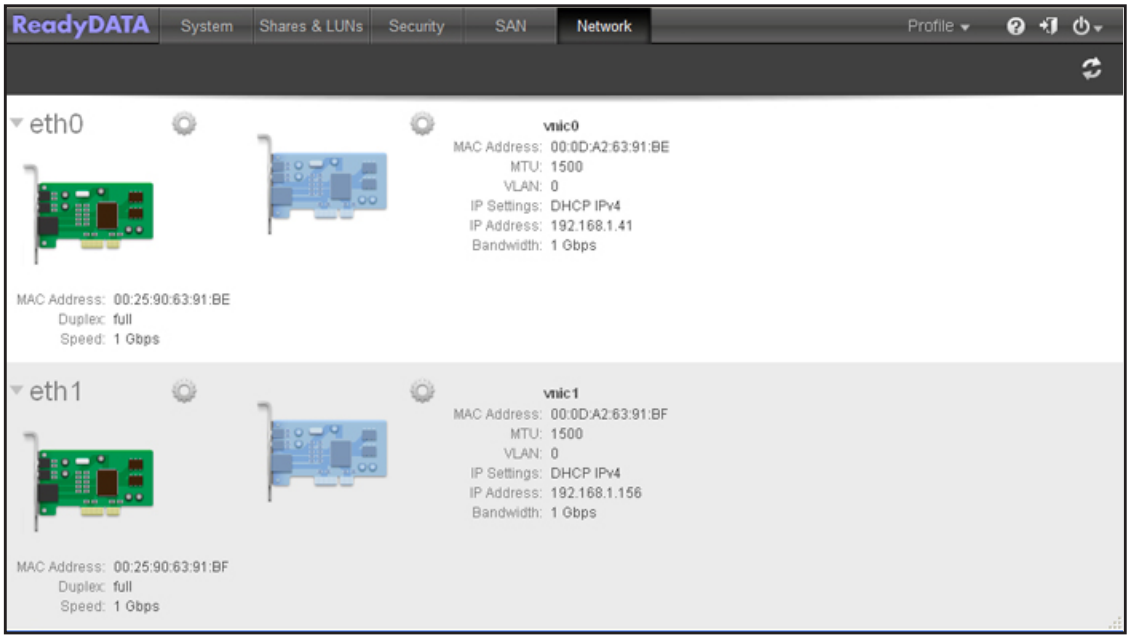
Item	Default Setting
Physical Ethernet interface (eth1 and eth2)	
MTU	1500
Speed (Mbps)	1000
Duplex	Full
Bonding	None
VNIC	One attached to each interface (for example, vnic0 to eth0 and vnic1 to eth1)
Virtual NICs (vnic0 and vnic1)	
MTU	1500
VLAN ID	0
Bandwidth limit	None
TCP/IP	IPv4 with DHCP enabled, and IPv6 disabled
DNS	No server

Configure the Physical Ethernet Interfaces

➢ **To configure an Ethernet interface:**

1. Select **Network**.

   The Network screen displays:

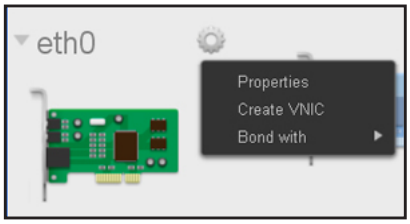


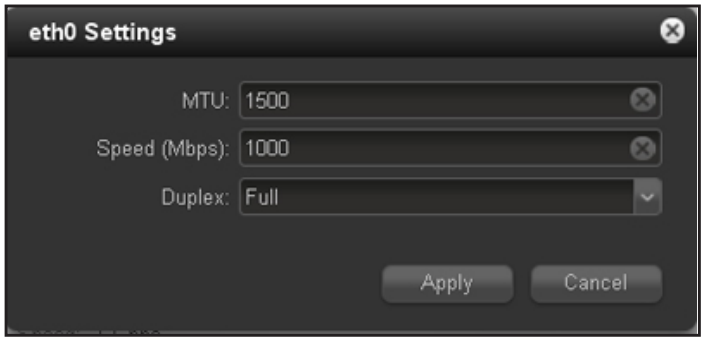
2. Click the gear icon to the right of an Ethernet interface.

   A pop-up menu displays (see the figure in *Step 3*).

3. Select **Properties**.

   The Ethernet Properties screen displays for the selected interface:





4. Configure the settings as explained in the following table:

Item	Description
MTU	Enter the MTU in bytes. The default setting is 1500 bytes.
Speed (Mbps)	Specify the interface speed. Because this setting does not determine the link speed, you can specify any setting between 1 Mbps and the maximum speed that is supported by the interface (either 1,000 Mbps or 10,000 Mbps).
Duplex	Select the duplex method from the drop-down list: • **Auto**. The ReadyDATA autosenses the type of duplex connection. • **Full**. Full duplex. This is the default setting. • **Half**. Half duplex.

5. Click **Apply**.

Configure the Virtual Network Interface Cards

By default, each physical Ethernet interface has one virtual NIC (VNIC) that has the following configuration:

- A generic label (default name) that is based on the number of the associated Ethernet interface. For example, vnic0 is associated with eth0.
- DHCP-enabled for IPv4
- No VLAN membership

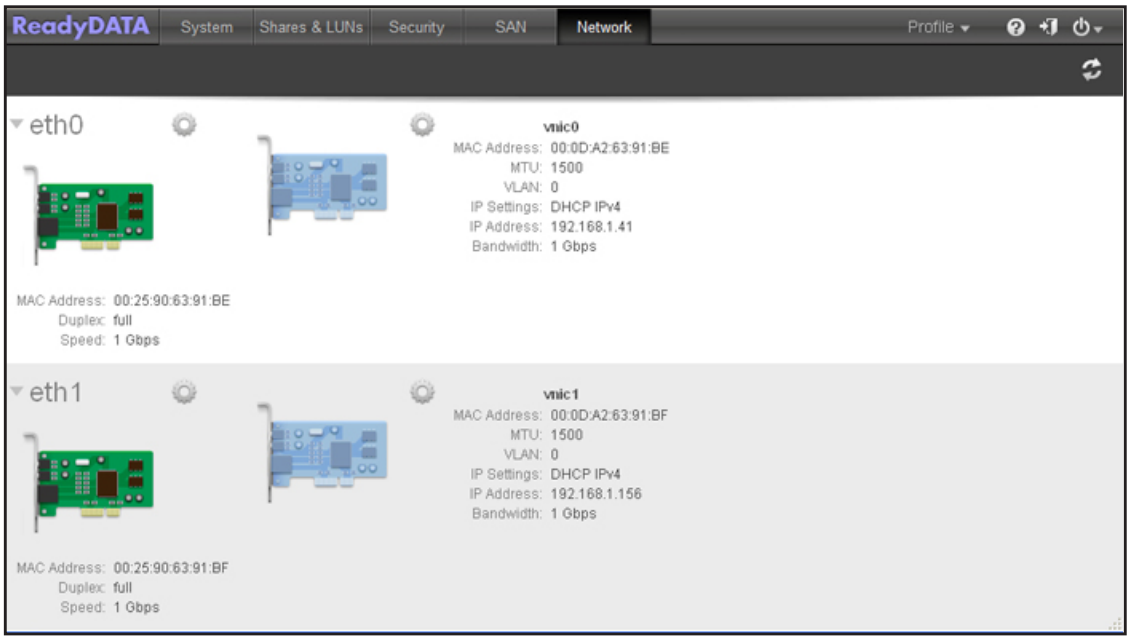
The default VNIC has the same numbering as the Ethernet interface that it is associated with (eth0 has vnic0; eth1 has vnic1).

You can add multiple VNICs to each single physical Ethernet interface and channel interface.

➢ **To create and configure a VNIC:**

1. Select **Network**.

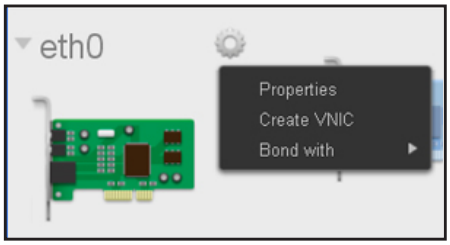
   The Network screen displays:



2. Click the gear icon to the right of an Ethernet interface.

   A pop-up menu displays (see the figure in *Step 3*).

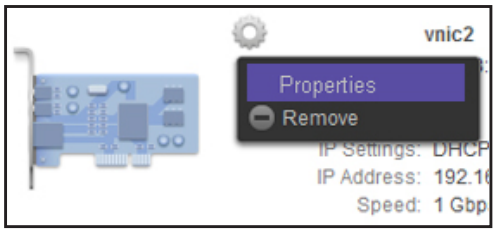
3. Select **Create VNIC**.



   The new VNIC displays next to the Ethernet interface. New VNICs are numbered in sequential and ascending order irrespective of the interface they are attached to. For example, in a system with two Ethernet interfaces, eth0 (with default vnic0) and eth1 (with default vnic1), a new VNIC is numbered vnic2, irrespective of whether you attach it to eth0 or eth1.

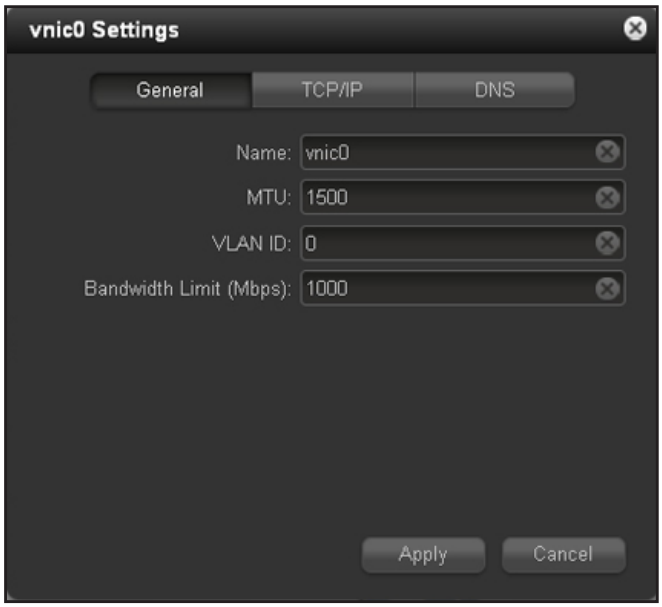
4. Click the gear icon to the right of the VNIC that you just created.

A pop-up menu displays:



5. Select **Properties**.

   The VNIC Settings pop-up screen displays with the General pane in view. (You can switch back and forth between the VNIC panes by clicking the General, TCP/IP, and DNS tabs.)



6. Configure the general settings as explained in the following table:

Item	Description
Name	Use the default name or enter a custom name. The default name is vnicX, in which X is a number in sequential and ascending order irrespective of the interface the VNIC is attached to. The default VNICs in a system with two interfaces are vnic0 and vnic1.
MTU	Enter the MTU in bytes. The default setting is 1500 bytes.

Item	Description
VLAN ID	Enter a VLAN ID. The default setting ID is 0. **Note:** If you use VLAN IDs, the switch to which you connect the ReadyDATA needs to support VLAN tagging.
Bandwidth Limit (Mbps)	Enter the bandwidth limit in Mbps. Depending on the Ethernet interfaces that are installed in the ReadyDATA, the maximum limit is either 1,000 Mbps or 10,000 Mbps.

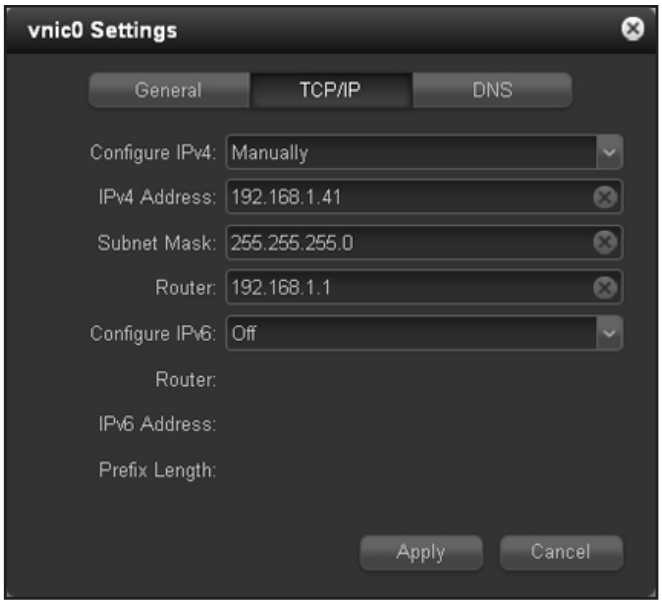
7. Click the **TCP/IP** tab.

   The IP settings display. The IPv4 and IPv6 settings are mutually exclusive.

8. Select whether to use IPv4 or IPv6.

   When you select a configuration method from the Configure IPv4 drop-down list, the IPv6 settings are dimmed; when you select a configuration method from the Configure IPv6 drop-down list, the IPv4 settings are dimmed.

   The following figure shows the IPv4 settings; the next figure shows the IPv6 settings.



9. Configure the IP settings as explained in the following table:

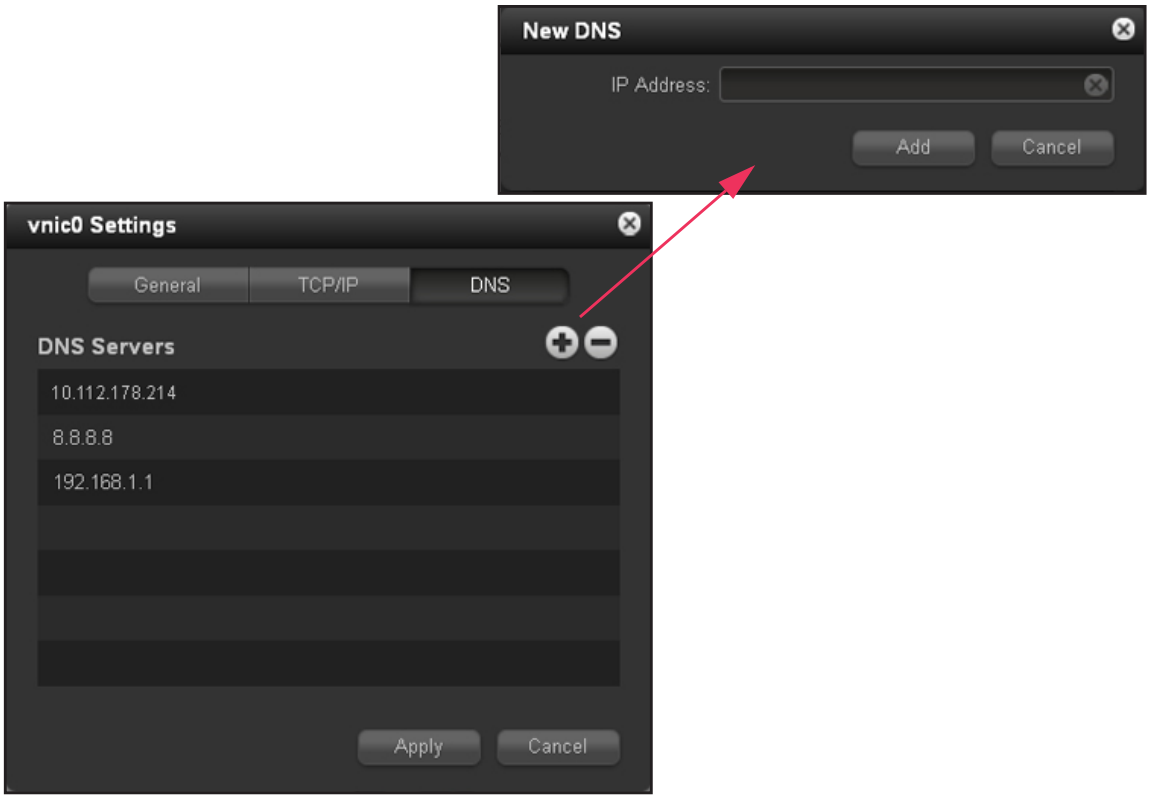
Item	Description	
IPv4 settings		
Configure IPv4	From the drop-down list, select how IPv4 is configured: • **Using DHCP**. The ReadyDATA functions as a DHCP client, and the IPv4 settings are automatically configured by a DHCP server on your network. • **Manually**. You need to enter the IPv4 address and subnet mask for the ReadyDATA, and the router through which the ReadyDATA is connected to the network.	
IPv4 Address	Enter the IPv4 address for the ReadyDATA.	Manual configuration only
Subnet Mask	Enter the subnet mask for the ReadyDATA.	
Router	Enter the IPv4 address for the router through which the ReadyDATA connects to your network. The default setting is 192.168.1.1.	
IPv6 settings		
Configure IPv6	From the drop-down list, select how IPv6 is configured: • **Automatically**. The ReadyDATA is configured with an IPv6 address through stateless autoconfiguration without the requirement of a DHCPv6 server on your network. The ReadyDATA does need to be connected to the Internet for stateless autoconfiguration to function. • **Using DHCP**. The ReadyDATA functions as a DHCPv6 client, and the IPv6 settings are automatically configured by a DHCPv6 server on your network. • **Manually**. You need to enter the IPv6 address and prefix length for the ReadyDATA, and the router through which the ReadyDATA is connected to the network.	

Item	Description	
Router	Enter the IPv6 address for the ReadyDATA.	Manual configuration only
IPv6 Address	Enter the prefix length for the ReadyDATA. The default address is ::1 (that is, 0::1).	
Prefix Length	Enter the IPv6 address for the router through which the ReadyDATA connects to your network. The default prefix length is 24.	

Note: *NETGEAR recommends that you use DHCP address reservation to make sure that the DHCP server always assigns the same IP address to the interfaces of the ReadyDATA. The MAC addresses of the physical interfaces and VNICs are shown on the Network screen.*

10. Click the **DNS** tab.

    The DNS settings display:



11. To add a DNS server, click the **+** button.
12. Enter an IP address.
13. Click **Add**.
14. (Optional) To add more DNS servers, repeat *Step 11* through *Step 13*.

    You can configure multiple DNS servers.

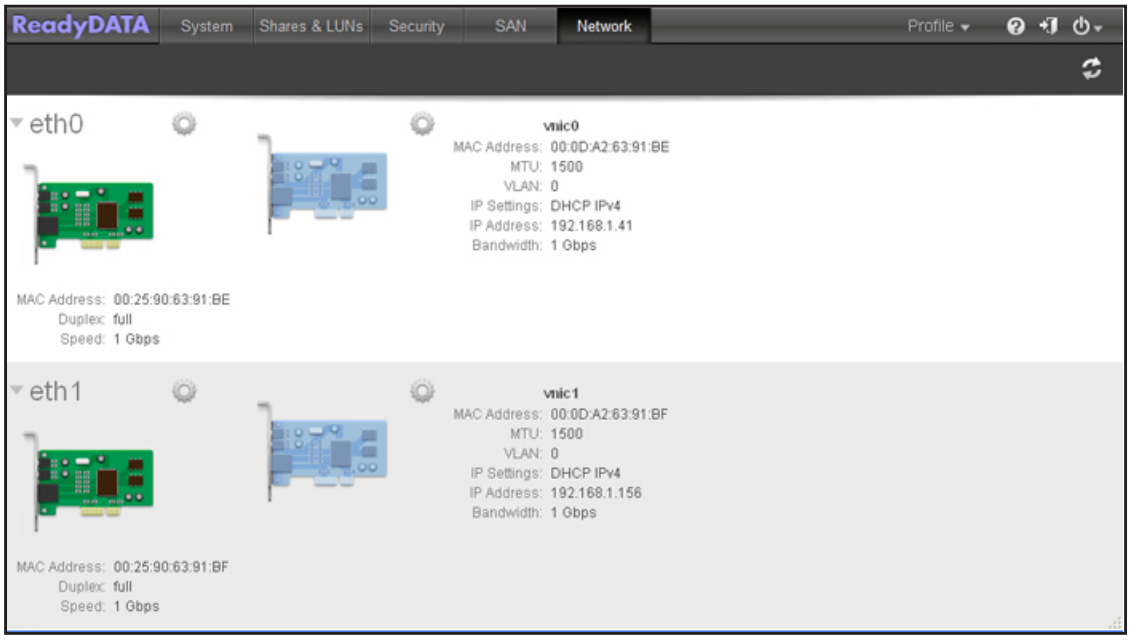
15. (Optional) To remove a DNS server, select the server, and click the **-** button.
16. Click **Apply** to save the settings on all three VNIC panes.

> **Note:** If you change the IP address of the ReadyDATA, your browser loses its connection to Dashboard. To reconnect to the ReadyDATA, launch the RAIDar utility, click the **Rescan** button to locate the device, and click the **Setup** button to reconnect.

➢ **To remove a VNIC:**

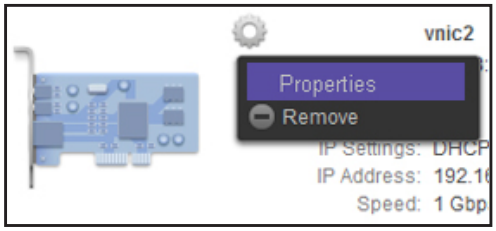
1. Select **Network**.

   The Network screen displays:



2. Click the gear icon to the right of the VNIC that you want to remove.

   A pop-up menu displays:



3. Select **Remove**.
4. Confirm the removal.

Automatic Private IP Addressing without a DHCP Server

The ReadyDATA requires an IPv4 DHCP server for initial configuration of the VNICs, which, by default, are configured as DHCP clients.

If the ReadyDATA cannot locate a DHCP server, it is assigned an Auto-IP address through Automatic Private IP Addressing (APIPA). The IP address is in the 169.254.x.x/16 subnet. The last two octets of the address are based on the MAC address of the physical interface, which is printed on a label next to the physical interface. You need to convert the hexadecimal MAC address to decimal numbers to determine the last two octets of the IP address. In the unlikely situation that there is another device with the same IP address on the subnet, the ReadyDATA attempts to use the next IP address (169.254.x.x+1).

As an example:
If the MAC address is 00:25:90:63:91:be, the IP address is 169.254.145.190/16.
The fifth octet of the MAC address is 91, which translates to 145 in decimal notation.
The sixth octet of the MAC address is be, which translates to 190 in decimal notation.

Configure Channel Bonding

Channel bonding is optional.

A bonded channel combines two Ethernet interfaces into a single logical link or link aggregation group (LAG). Network devices treat the aggregation as if it is a single link, which increases fault tolerance and provides load sharing.

The ReadyDATA supports a static LAG and a dynamic LAG with active or passive LACP for automatic configuration of a channel link with another device. Both the ReadyDATA and the device with which the channel link is established need to support the same mode (static LAG or dynamic LAG).

On the ReadyDATA, LAGs are implemented with three hash types:

- **Layer 2**. Based on the source and destination MAC addresses. All traffic between the ReadyDATA and a particular device is transmitted on the same physical link.
- **Layer 3**. Based on the source and destination IP addresses. Here too, all traffic between the ReadyDATA and a particular device is transmitted on the same physical link.
- **Layer 4**. Based on the source and destination port numbers. Traffic between the ReadyDATA and a particular device can be spread across multiple links.

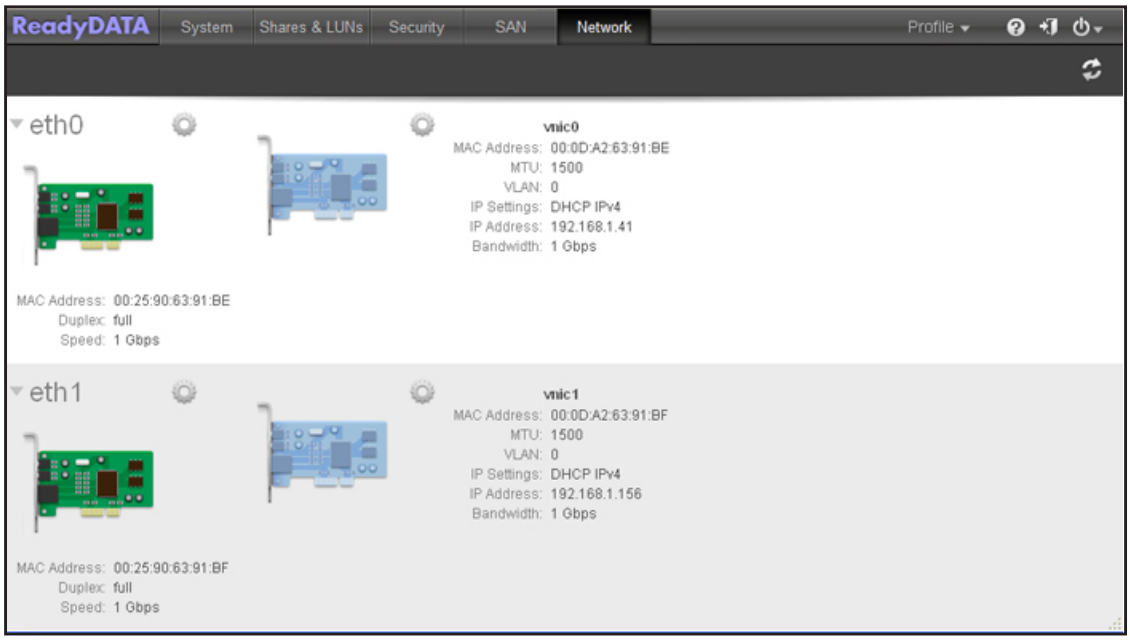
You can select to use combinations of hash types, in which case the hash types are used simultaneously and the connection might be more secure but slightly slower.

After you create an aggregation link, you can expand the link with yet another interface (three Ethernet interfaces), or even another aggregation link (four Ethernet interfaces). Alternately, with four Ethernet interfaces, you can create two aggregation links and then aggregate these two links into one double aggregation link that consists of all four Ethernet interfaces.

➢ **To configure a bonded channel:**

1. Select **Network**.

The Network screen displays:

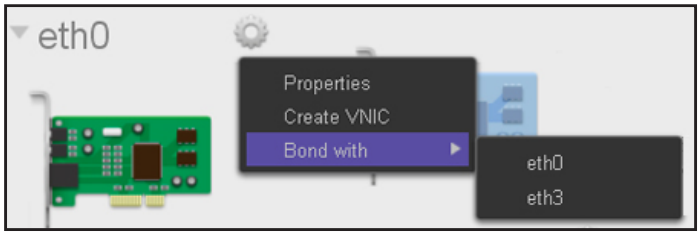


2. Click the gear icon to the right of an Ethernet interface.

   A pop-up menu displays (see the figure in *Step 3*).

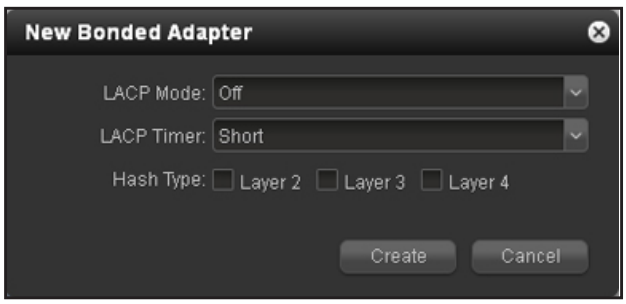
3. Select **Bond with**.

   A second pop-up screen displays the Ethernet interfaces and, if already configured, the aggregated interfaces (bonded channels):



4. Select the name of the interface that you want to be member of the bonded channel.

   The New Bonded Adaptor pop-up screen displays:



5. Configure the settings as explained in the following table:

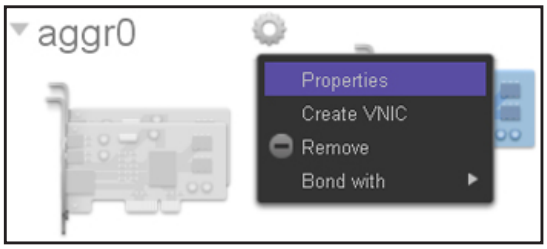
Item	Description
LACP Mode	Select the LACP mode from the drop-down list: • **Off**. The aggregation interface does not transmit LACPDUs to other LACP devices or respond to LACPDUs from other LACP devices. Select this mode for a static LAG. This is the default setting. • **Active**. The aggregation interface actively transmits LACPDUs to other LACP devices to set up a link channel. Select this mode for a dynamic LAG with active LACP. • **Passive**. The aggregation interface responds only to LACPDUs from other LACP devices. Select this mode for a dynamic LAG with passive LACP. **Note:** Both the ReadyDATA and the device with which the channel link is established need to support the same mode.
LACP Timer	If the LACP mode is set to Active, select a value for the LACP timer from the drop-down list: • **Short**. LACPDUs are sent frequently, that is, there is a short interval between LACPDU transmissions. This is the default setting. • **Long**. LACPDUs are sent infrequently, that is, there is a long interval between LACPDU transmissions.
Hash Type	Select one or more check boxes to specify the hash types to be used: • **Layer 2**. The channel link that is established is based on the source and destination MAC addresses. • **Layer 3**. The channel link that is established is based on the source and destination IP addresses. • **Layer 4**. The channel link that is established is based on the source and destination port numbers.

6. Select **Create**.

   The new bonded channel displays as an aggregation interface (aggrX, in which X is a number in sequential and ascending order) on the Network screen.

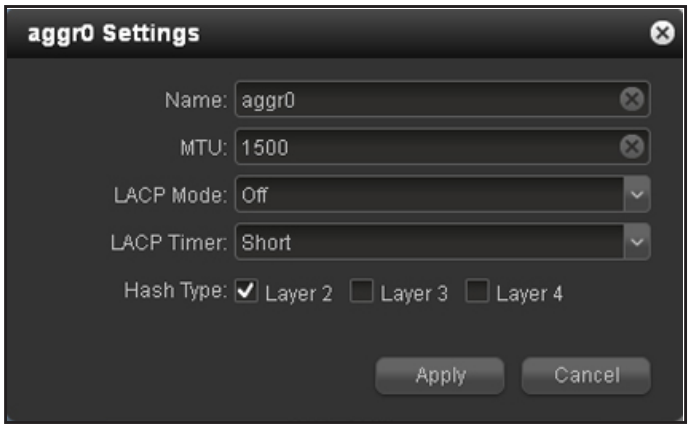
7. To configure the new aggregation interface further, click the gear icon to the right of the aggregation interface.

   A pop-up menu displays:



8. Select **Properties**.

   The aggregation settings pop-up screen displays:



9. Configure the general settings as explained in the following table:

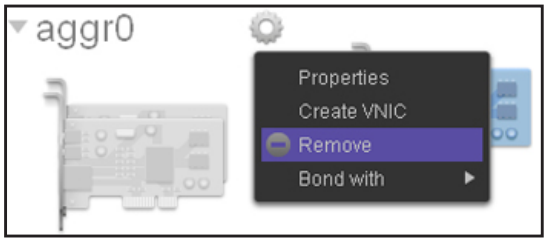
Item	Description
Name	Use the default name or enter a custom name. The default name is aggrX, in which X is a number in sequential and ascending order.
MTU	Enter the MTU in bytes. The default setting is 1500 bytes.
LACP Mode	You configured these settings when you set up the aggregation interface. For information about these settings, see the table in *Step 5*. (You can make changes on the aggregation settings pop-up screen.)
LACP Timer	
Hash Type	

10. Click **Apply**.
11. Configure the switch or router to which the ReadyDATA is attached for channel bonding.

➢ **To remove an aggregation link and reestablish separate Ethernet interfaces:**

1. Click the gear icon to the right of the aggregation interface that you want to remove.

   A pop-up menu displays:



2. Select **Remove**.
3. Confirm the removal.
4. Reconfigure the switch or router to which the ReadyDATA is attached for single interfaces.

Configure Global File-Sharing Protocols

Network access to data stored on the ReadyDATA is managed by file-sharing protocols, which handle the type of access and transfer of data, or for Bonjour and SNMP, discovery and management of the ReadyDATA in a network. For shares, you can select several protocols; for LUNs, the protocol is always iSCSI. (iSCSI is enabled by default.)

The global file-sharing protocol settings affect the file-sharing protocols that allow access to shares. If a protocol is globally disabled, you *can* configure it for a share, but it does not take effect until you enable the protocol globally. For information about how to configure and enable file-sharing protocols for shares, see *File-Sharing Protocols to Access Shares* on page 70.

Supported File-Sharing Protocols

The ReadyDATA supports the following file-sharing protocols:

- **SMB (Server Message Block)**. Used mainly by Microsoft Windows computers and sometimes by Mac OS X computers for share access. SMB uses TCP/IP. SMB is enabled by default.
- **AFP (Apple File Protocol)**. AFP is used by Mac OS X computers for share access. AFP is enabled by default.
- **NFS (Network File Service)**. Used by Linux and Unix clients for share access. Mac OS X users can access NFS shares through console shell access. The ReadyDATA supports NFS over UDP and TCP. NFS is disabled by default.
- **FTP (File Transfer Protocol)**. The ReadyDATA supports anonymous and controlled user access for FTP clients. You can elect to set up port forwarding to nonstandard ports for better security when you access files over the Internet. FTP is disabled by default.
- **SNMP**. Lets you monitor but not manage the ReadyDATA over a network management system. SNMP is disabled by default.
- **SSH**. Lets you remotely manage the ReadyDATA over an SSH connection. SSH is disabled by default.

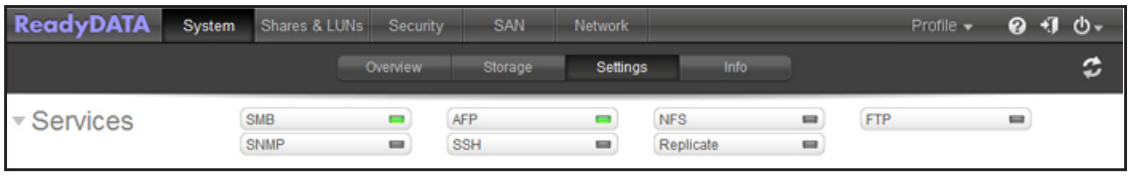
By default, SMB, and AFP are enabled; FTP, NFS, SSH, and SNMP are disabled.

Configure File-Sharing Protocols

➢ **To view and globally configure file-sharing protocols:**

1. Select **System > Settings > Services**.

   The Services section of the Setting screen displays (the following figure shows the top of the screen only):



The protocol buttons with a green LED are globally enabled; those with a black LED are globally disabled. Click a protocol button to display the protocol settings screen.

2. Configure the protocol settings one protocol at a time as explained in the following sections.

Note: For information about the Replicate button (see the previous figure), see *Chapter 7, Backup, Replication, and Recovery*.

Configure SMB, AFP, NFS, or SSH

The only option for these protocols is to enable or disable the protocol globally:

1. Click the protocol button (**SMB**, **AFP**, **NFS**, or **SSH)**.
2. Select the **Enable** check box to enable the protocol; clear the **Enable** check box to disable the protocol.
3. Click **Apply**.

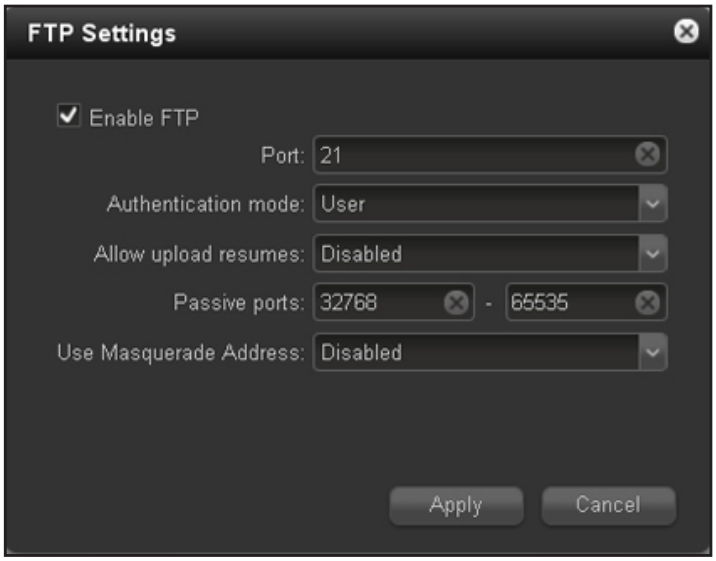
WARNING:

For SSH, if you enable SSH root access, NETGEAR might deny you technical support. If you do enable SSH root access, the SSH root password is identical to the administrator password that you have configured.

Configure FTP

1. Click the **FTP** button.

   The FTP Settings screen displays:



2. Configure the settings as explained in the following table:

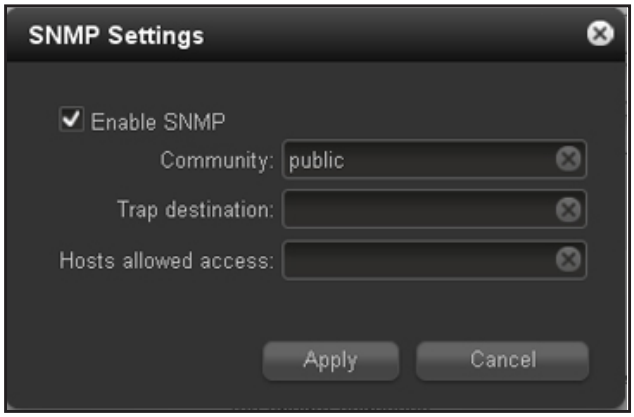
Item	Description	
Enable FTP	Select the check box to enable FTP globally; clear the check box to disable FTP globally.	
Port	Enter the number of the port that is used for FTP control traffic on the ReadyDATA. The default port number is 21.	
Authentication mode	Select the authentication mode from the drop-down list: • **Anonymous**. Users can connect anonymously. This is the default setting. • **User**. Users are authenticated through the local database.	
Allow upload resumes	Select whether users are allowed to resume a paused or stalled upload by making a selection from the drop-down list: • **Disabled**. Resuming an upload is disabled. This is the default setting. • **Enabled**. Resuming an upload is enabled.	
Passive ports	Enter the beginning port and ending port of the passive port range. This is the port range on the ReadyDATA that is available to clients who initiate a connection to the ReadyDATA. The default range is 32768–65535.	
Use Masquerade Address	Select whether the ReadyDATA displays its real IP address or masks this with another IP address or DNS name by making a selection from the drop-down list: • **Disabled**. The real IP address is displayed. • **Enabled**. The real IP address is masked. Use the Masquerade as field to specify an IP address or DNS name.	
	Masquerade as	Enter a public IP address or DNS name.

3. Click **Apply**.

Configure SNMP

1. Click the **SNMP** button.

   The SNMP Settings screen displays:



2. Configure the settings as explained in the following table:

Item	Description
Enable SNMP	Select the check box to enable SNMP globally; clear the check box to disable SNMP globally.
Community	Enter the community. Normally, you would enter public for a read-only community and private for a read-write community. You can leave the Community field set to public (which is the default setting), or specify a private name if you have a more segregated monitoring scheme.
Trap destination	Enter the IP address to which the ReadyDATA sends the traps that it generates. For information about the types of messages that can be sent, see *System Logs* on page 147.
Hosts allowed access	Enter a network address that specifies the hosts that are allowed to access the ReadyDATA.

3. Click **Apply**.

Note: For information about the NETGEAR SNMP MIB, see *SNMP Monitoring* on page 149.

4 Manage Shares and LUNs

This chapter describes how to create, manage, and access shares and LUNs on the ReadyDATA. This chapter includes the following sections:

- *Shares and LUNs*
- *Manage Shares For Network Attached Storage*
- *Set Up Access Rights to Shares*
- *Manage LUNs For Storage Area Networks*
- *Assign LUNs to LUN Groups and Manage Access Rights*
- *Access a Share from Network-Attached Device*
- *Access LUN Groups from an iSCSI-Attached Device*

Note: Without a volume, you cannot configure any shares or LUNs. For information about how to configure volumes, see *Chapter 2, Manage Disks and Volumes*.

Shares and LUNs

The volumes on your ReadyDATA can be divided into shares and logical unit numbers (LUNs), both of which are logical entities on one or more disks.

- **Shares**. Shares are NAS data sets that allow data transfer and storage over SMB, NFS, AFP, and FTP. (For general information about these protocols, see *Configure Global File-Sharing Protocols* on page 63). Dashboard displays shares in the following way:

Figure 5. Share icon

- **LUNs**. LUNs are SAN data sets that allow data transfer and storage over iSCSI and Fiber Channel devices. The ReadyDATA supports iSCSI devices only. Dashboard displays LUNs in the following way:

Figure 6. LUN icon

Shares and LUNs enable you to organize data in a volume by type, group, user, department, and so on. Within one volume, you can create multiple shares and LUNs, each one with its own specific configuration.

This chapter explains the configuration and use of shares and LUNs in detail.

Manage Shares For Network Attached Storage

About Shares

Each share has a configuration that is independent of other shares that reside on the same volume. A share configuration includes settings such as logbias, compression, deduplication (referred to as dedupe), protection, file-sharing protocols, and access rights. These settings are explained in the following sections.

The configuration settings of a share are stored in the volume (that is, in the pool) in which the share resides. This design allows a share to be portable when a disk is moved from one array to another array. You can specify whether a snapshot is created, and with what frequency it is created.

You can specify the size of a share in two ways:

- **Undefined**. The entire nonreserved storage space on the volume is available to the share. Storage space is assigned on demand instead of up front. This method greatly improves the utilization rate of the share because storage space is assigned only as data is written to the share. The size of the share is reported as the entire nonreserved storage space on the volume. As data is written to the share, the used storage space is displayed on the volume icon in purple.
- **Quota**. You set a quota for the share. All storage space that you specify when you create the share is also allocated up front. The share size cannot grow beyond the quota, but you can increase the quota. The size of the share is reported as the quota that you specify. As data is written to the share, the used storage space is displayed on the volume icon in purple.

  Although the quota of an individual share cannot exceed the size of the volume, a volume allows oversubscription: the aggregate quota of the shares on a volume *can* exceed the size of the volume. Taking reserved storage space into account, storage space is assigned on demand.

In addition, whether you set a quota or not, you can reserve share storage space to guarantee that storage space is available on the volume. Snapshots, other shares, and LUNs on the volume cannot consume storage space that is reserved. The reserved storage space is displayed on the volume icon in orange.

The following table explains the default settings of a share. You can change these settings when you create or change the share.

Table 6. Share default settings

Item	Default State
Logbias[a]	Latency
Compression	Disabled
Dedupe	Disabled
Protection	Continuous
Interval	Daily
Size	No limitation
Access	Denied until you set permissions

a. You can change the logbias only when you change the properties of a share.

File-Sharing Protocols to Access Shares

The availability of a file-sharing protocol for shares depends on the global file-sharing protocol setting. If a protocol is globally disabled, you *can* configure it for a share, but it does not take effect until you enable the protocol globally. For information about global file-sharing protocols, see *Configure Global File-Sharing Protocols* on page 63.

Shares are accessed over a LAN or WAN network connection. Network access to data stored on the ReadyDATA is managed by file-sharing protocols, which also handle the transfer of data. You can enable multiple protocols for an individual share, allowing users to access the share through various methods. The ReadyDATA supports the following file-sharing protocols for share access:

- **SMB (Server Message Block)**. Used mainly by Microsoft Windows computers and sometimes by Mac OS X computers. SMB uses TCP/IP.
- **AFP (Apple File Protocol)**. Used by Mac OS X computers.
- **NFS (Network File Service)**. Used by Linux and Unix clients. Mac OS X users can access NFS shares through console shell access. The ReadyDATA supports NFS over UDP and TCP.
- **FTP**. The ReadyDATA supports anonymous or user access for FTP clients. You can elect to set up port forwarding to nonstandard ports for passive FTP, allowing clients to initiate a connection to the ReadyDATA.

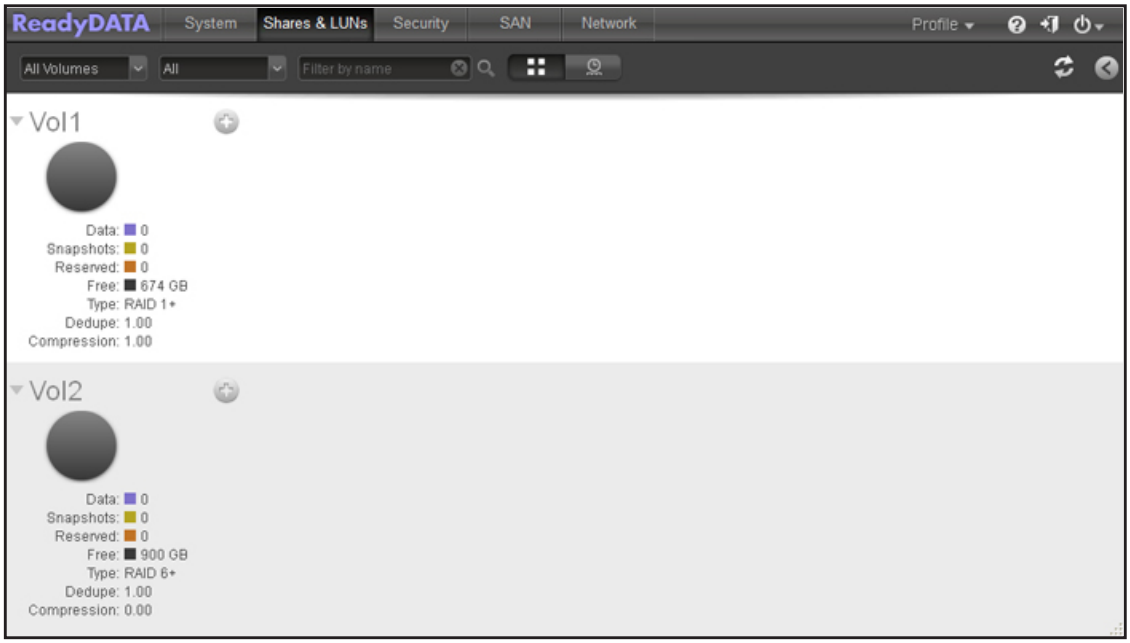
Create a Share

After you create a volume (see *Create a Volume and Select the RAID Level* on page 23), you can create shares on that volume.

➢ **To create a share:**

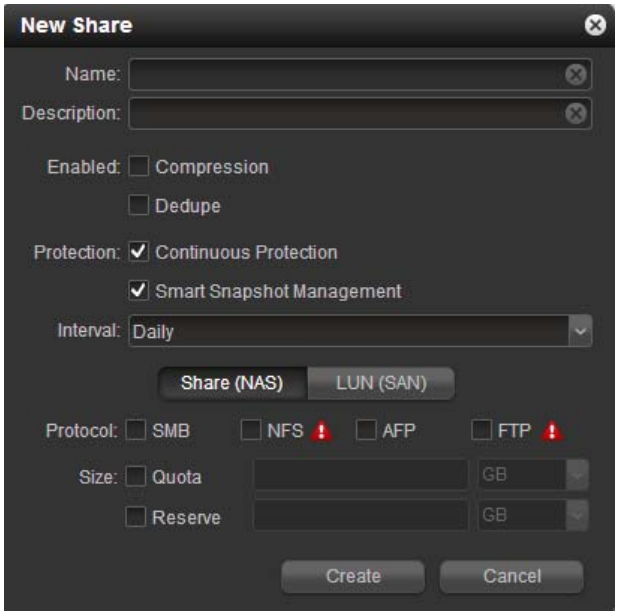
1. Select **Shares**.
2. Click the **Data Set** button (with four cubes, ).

The Shares screen displays, showing the configured volumes on the left:



3. Click the **+** button ( ) to the right of the volume to which you want to add a share.

   The New Share pop-up screen displays:



4. Configure the settings as explained in the following table:

Item	Description	
Name	A unique name to identify the share. Do not include spaces in the name.	
Description	An optional description to help identify the share.	
Compression	Select the **Compression** check box to enable data compression. Compression saves storage space and increases the speed of data transfers, but the compression and decompression processes require additional resources. By default, the Compression check box is cleared.	
Dedupe	Select the **Dedupe** check box to enable deduplication, which prevents storage of redundant data on the share. Unique data is stored only once on the share, and other instances of the identical data are removed and replaced by a pointer to the unique data. This storage method saves storage space and increases the speed of data transfers. By default, the Dedupe check box is cleared.	
Protection	Select the **Continuous Protection** check box to enable data protection through snapshots and configure the frequency at which snapshots are made. By default, the Continuous check box is selected. For more information about snapshots, see *Manage Snapshots for Shares and LUNs* on page 158.	
	Smart Snapshot Management	Select the **Smart Snapshot Management** check box to enable automatic snapshot pruning. When enabled, this feature deletes older snapshots so that hourly snapshots are kept for 48 hours, daily snapshots are kept for 4 weeks, weekly snapshots are kept for 8 weeks, and monthly snapshots are kept indefinitely.
	Interval	The interval specifies how often a snapshot is made. Make a selection from the drop-down list: • **Hourly**. A snapshot is taken every hour on the hour. • **Daily**. A snapshot is taken every day at midnight. This is the default setting. • **Weekly**. A snapshot is taken every week on Friday at midnight.
Share (NAS)	Click the **Share (NAS)** button, which is the default setting. (Clicking the LUN (SAN) button creates a LUN; see *Create a LUN* on page 92.)	
	Type	Select the check boxes for the file-sharing protocols that you want to enable on the share: • **SMB** • **NFS** • **AFP** • **FTP** For information about these protocols, see *File-Sharing Protocols to Access Shares* on page 70. **Note:** If the New Share pop-up screen displays a red triangle with an exclamation mark for a protocol (for example, ), the protocol is globally disabled. For information about how to enable the protocol globally, see *Configure Global File-Sharing Protocols* on page 63.

Item	Description		
Size	If you do not set a size, the share has unlimited access to the storage space on the volume, and the utilization rate of the share is greatly improved (over predefining the size) because storage space is assigned only as data is written to the share. By default, there is no quota and reserve set when you create a share.		
	Quota	Select the **Size** check box and enter the size of the storage space that is available to the share.	Select the unit of measurement from the drop-down list: • **MB**. • **GB**. This is the default unit of measurement. • **TB**.
	Reserve	Select the **Reserve** check box to reserve guaranteed storage space for the share on the volume.	

5. Click **Create**.

   The ReadyDATA confirms the creation of a share with the message “Data Set successfully created.” The new share is added to the Shares screen. Basic information is displayed to the right of the share.

View and Change the Properties of a Share

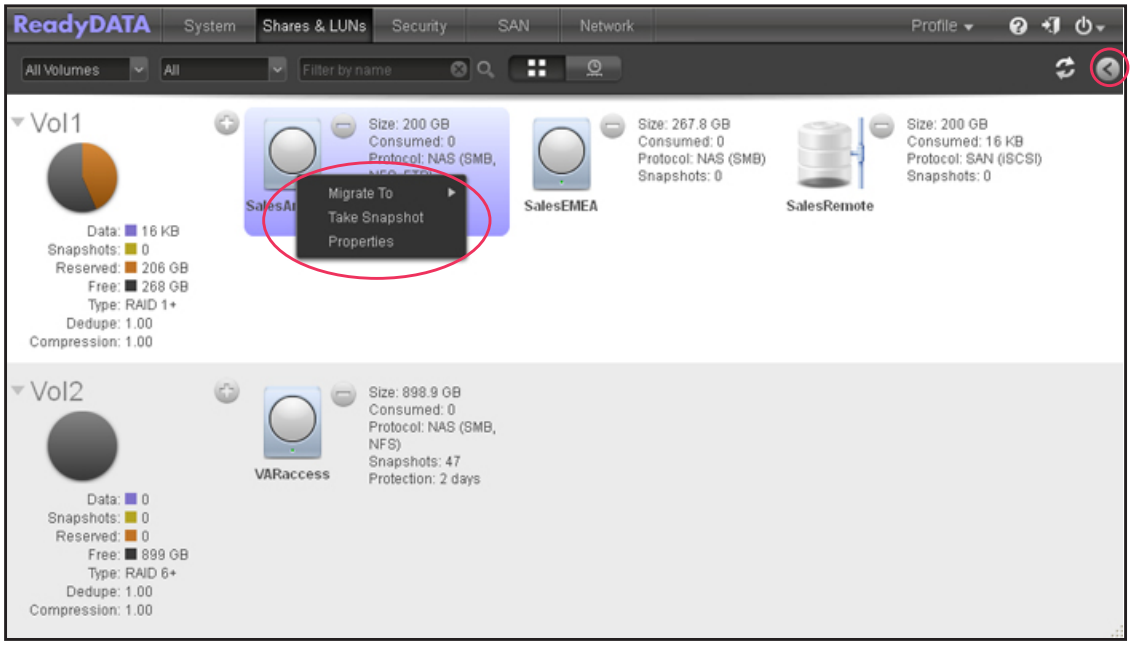
➢ **To view and change the properties of a share:**

1. Select **Shares**.
2. Click the **Data Set** button (with four cubes, ).

   The Shares screen displays (see the figure in *Step 4*).
3. Select the share that you want to explore by clicking it.

   The color of the share turns purple.
4. Right-click the share.

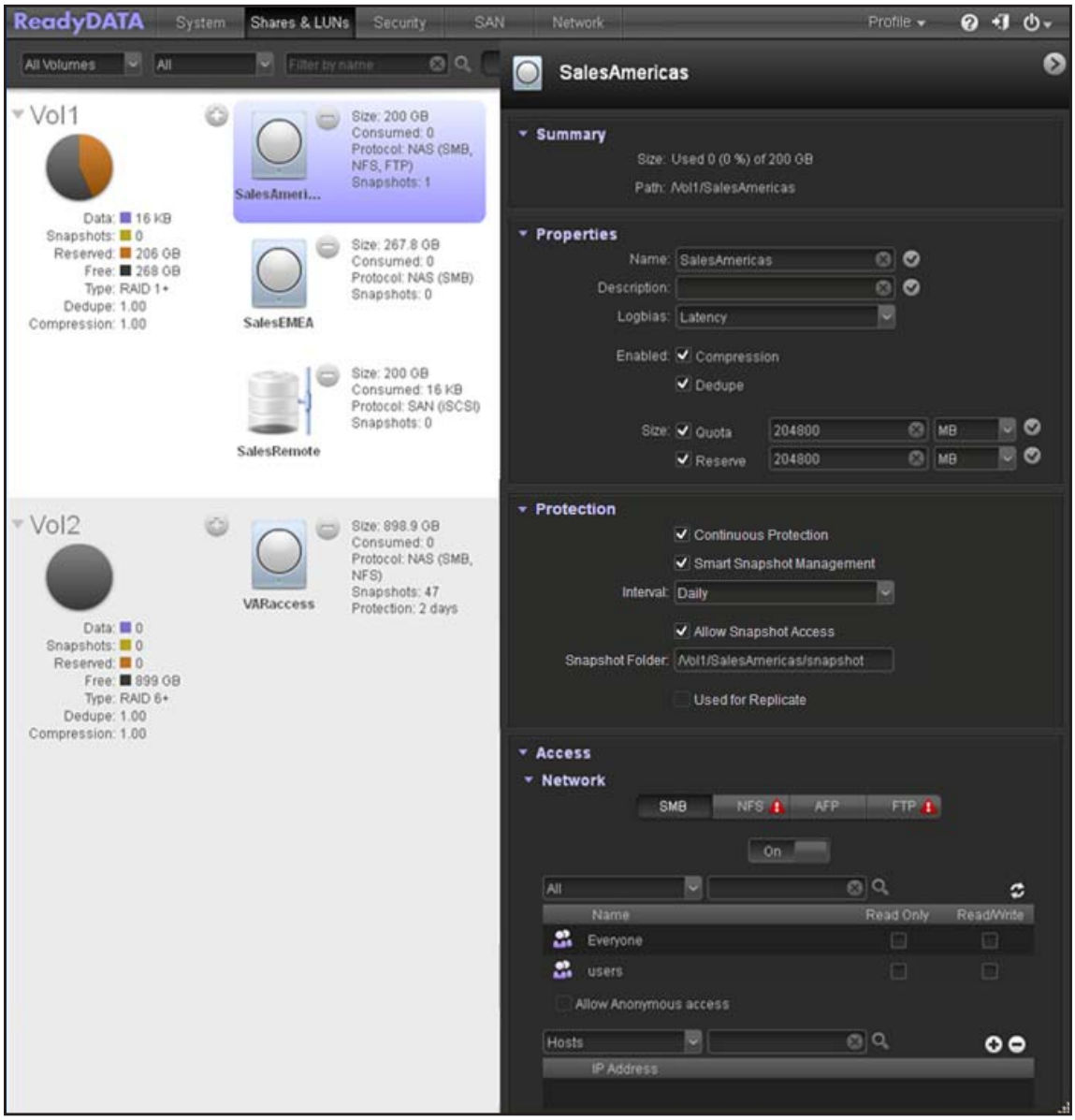
A pop-up menu displays:



5. Select **Properties**.

The Properties pane for the selected share displays at the right of the screen (see the next figure). The properties that are displayed in the Access section depend on the selected file-sharing protocol or protocols.

Note: You can also use a shortcut to display the Properties pane of a share. Click the screen **Expand** button ( ) on the top right of the screen to display the Properties pane (see the red oval on the top right of the previous figure). Click the same button (which now appears as a reversed arrow) again to hide the Properties pane.



6. Change the settings as explained in the following table. Click the flag button ( ) to save any changes in a field or drop-down list.

Item	Description
Summary	
Size	The size is provided for information only. To change the size, see the Size fields in the Properties section of the Properties pane.
Path	The path is provided for information only.
Properties	
Name	A unique name to identify the share. Do not include spaces in the name.

Item	Description		
Description	An optional description to help identify the share.		
Logbias	Change the logbias setting by making a selection from the Logbias drop-down list: • **Latency**. Data requests are handled at high priority with a minimum of delay, but data throughput might not be optimum. This is the default setting that is automatically assigned when you create a share. • **Throughput**. Data requests are handled with high data throughput, but there might be delay in response to requests.		
Compression	Select the **Compression** check box to enable data compression. Compression saves storage space and increases the speed of data transfers, but the compression and decompression processes require additional resources.		
Dedupe	Select the **Dedupe** check box to enable deduplication, which prevents storage of redundant data on the share. Unique data is stored only once on the share, and other instances of the identical data are removed and replaced by a pointer to the unique data. This storage method saves storage space and increases the speed of data transfers.		
Size	You can increase the quota or reservation of an existing share without affecting or disconnecting any users. Expansion is instant, regardless of the data size.		
	Quota	Select the **Size** check box and enter the size of the storage space that is available to the share.	Select the unit of measurement from the drop-down list: • **MB**. • **GB**. • **TB**.
	Reserve	Select the **Reserve** check box to reserve guaranteed storage space for the share on the volume.	
Protection			
Continuous Protection	Select the **Continuous Protection** check box to enable data protection through snapshots and configure the frequency at which snapshots are made. By default, the Continuous check box is selected. For more information about snapshots, see *Manage Snapshots for Shares and LUNs* on page 158.		
	Smart Snapshot Management	Select the **Smart Snapshot Management** check box to enable automatic snapshot pruning. When enabled, this feature deletes older snapshots so that hourly snapshots are kept for 48 hours, daily snapshots are kept for 4 weeks, weekly snapshots are kept for 8 weeks, and monthly snapshots are kept indefinitely. **Note:** For shares or LUNs that were created before the release of this feature, Smart Snapshot Management is disabled by default.	
	Interval	The interval specifies how often a snapshot is made. Make a selection from the drop-down list: • **Hourly**. A snapshot is taken every hour on the hour. • **Daily**. A snapshot is taken every day at midnight. This is the default setting. • **Weekly**. A snapshot is taken every week on Friday at midnight.	

Item	Description
Allow snapshot access	Select the **Allow snapshot access** check box to allow snapshot access to anyone who has permission to access the share. The default snapshot access folder displays in the Snapshot folder field. When you allow snapshot access, a subfolder with the name *snapshot* is created on the share to allow users access to data from past snapshots. Users can then access older versions of their files or recover files that were deleted.
Access	
For information about how to provide share access to users and groups, see *Set Up Access Rights to Shares* on page 80.	

Note: The changes that you make on the Properties pane take effect immediately (that is, no Apply button exists to confirm the changes).

Migrate a Share to Another Volume

Migrating a share to another volume allows you to reorganize a volume or remove the shares from a volume before deleting the volume.

WARNING:

Migrating a share to another volume causes all users to be disconnected from the share.

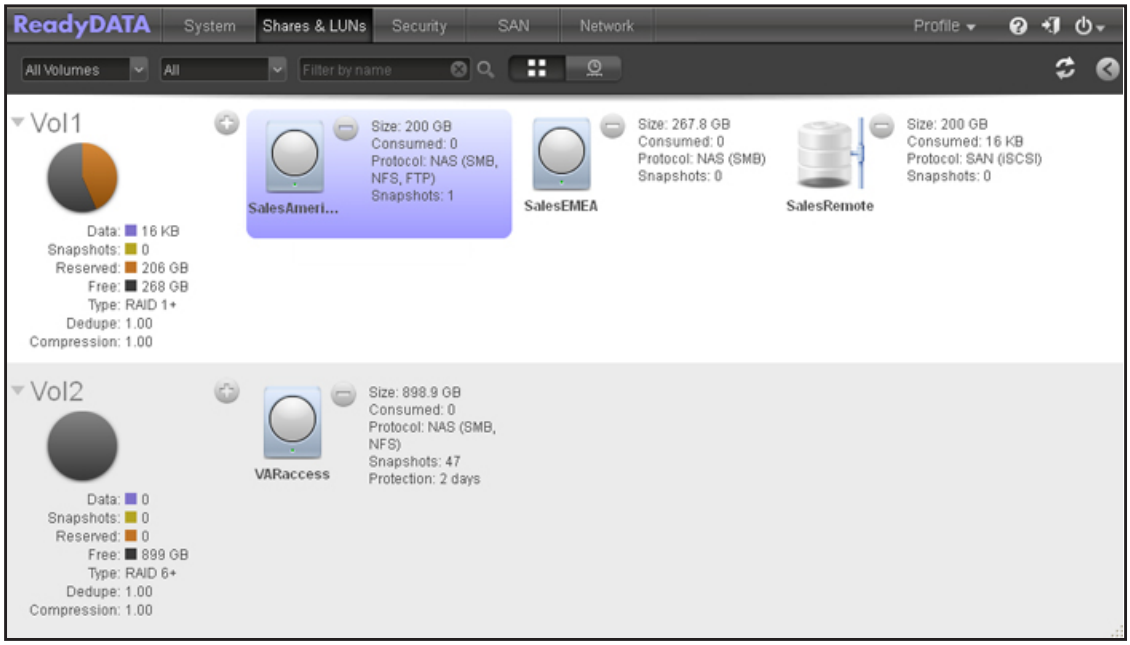
Note: A cloned share cannot be migrated to a volume that does not contain its parent. For more information about clones, see *Clone a Snapshot* on page 165.

➢ **To migrate a share to another volume:**

1. Select **Shares**.
2. Click the **Data Set** button (with four cubes, ).

   The Shares screen displays (see the figure in *Step 3*).
3. Select a share by clicking it.

The color of the share turns purple:

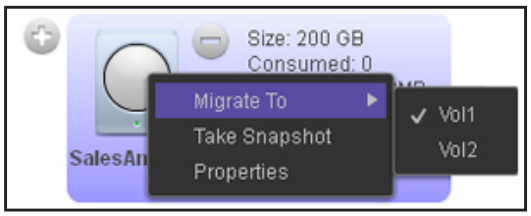


4. Right-click the share.

   A pop-up menu displays.

5. Select **Migrate To**.

   A second pop-up menu displays the volumes:



   By default, the volume on which the share resides is flagged.

6. Select the name of the destination volume.
7. Confirm the migration.

   A progress circle ( ) displays the progress of the migration.

Delete a Share

WARNING:

Deleting a share permanently removes the data within that share.

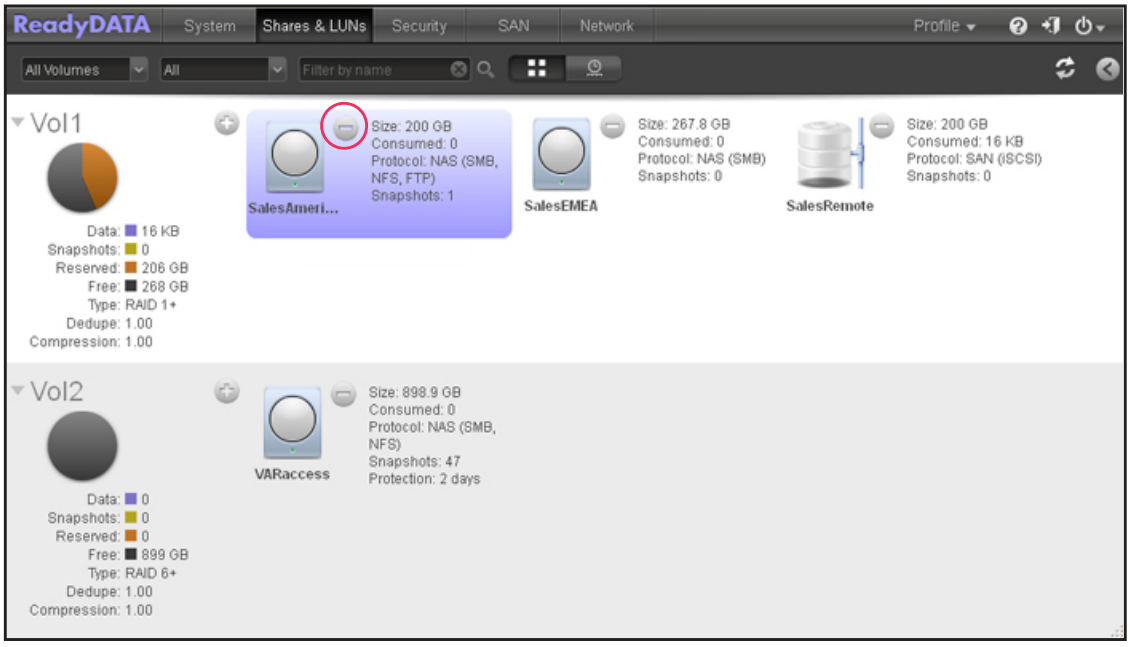
Note: A share that is the parent of a clone cannot be deleted. To delete the parent share, you must first delete all of its clones. For more information about clones, see *Clone a Snapshot* on page 165.

➢ **To delete a share from a volume:**

1. Select **Shares**.
2. Click the **Data Set** button (with four cubes,).

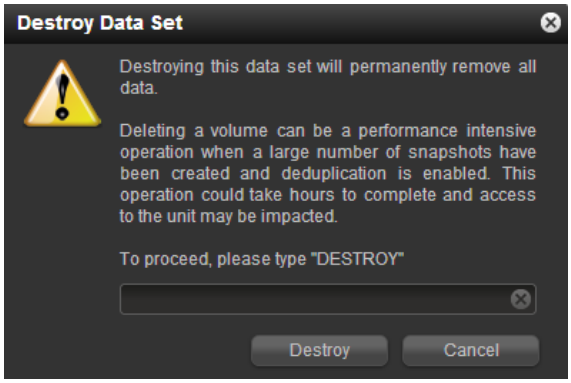
   The Shares screen displays (see the figure in *Step 3*).
3. Select a share by clicking it.

   The color of the share turns purple:



4. Click the **-** button ( ) to the right of the share.

A pop-up screen displays.



5. Confirm the deletion by typing **DESTROY** into the field.
6. Click **Destroy**.

   The share is deleted.

Set Up Access Rights to Shares

- *Configure the Network Access Settings*
- *Configure the Advanced Access Settings*
- *Configure the File and Folder Access Settings*

A file-sharing protocol determines how you set up access rights to an individual share and grant or restrict access rights to users, groups, hosts, or all of the above. For example, you might want to grant a user read/write permission on one share, read-only permission on another share, and no access rights at all on a third share.

The following access rights options are available:

- **Read Only**. This permission allows a user or group (or users or groups on a host) to read files on the share but prevents the editing, creation, and deletion of files and folders on the share.
- **Read/Write**. This permission allows a user or group (or users or groups on a host) to read, edit, create, and delete files and folders on the share. By default, all users and groups have read/write access.

The global security access mode determines whether users are authenticated through the local database of the ReadyDATA or through an external Active Directory (see *Configure the Global Security Access Mode* on page 123):

- **Local user database**. If you use the local database, first create user groups and user accounts before you set up share access rights. The groups and users are displayed in the Access section on the Properties pane of a share. For more information about creating and managing groups and user accounts, see *Chapter 5, Manage User Groups and User Accounts*.

- **Active Directory**. If you use an external Active Directory, the user and group information is downloaded into the ReadyDATA and displayed in the Access section on the Properties pane of a share.

A button with a red triangle and an exclamation mark (for example, 

) indicates that the file-sharing protocol is globally disabled. For information about how to enable the protocol, see *Configure Global File-Sharing Protocols* on page 63. Even though a file-sharing protocol can be globally enabled, you can disable it for an individual share.

The access settings that you can configure for an individual share depend on the file-sharing protocol that is assigned to the share:

Table 7. Access settings and file-sharing protocols

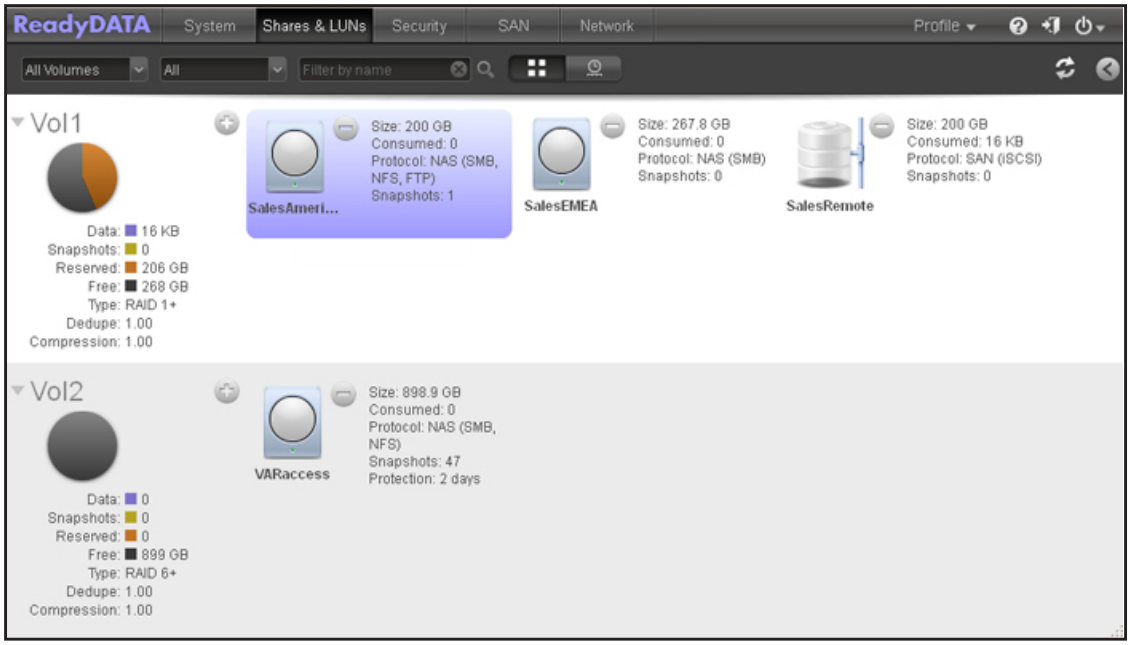
Access Settings		Protocols			
		SMB	NFS	AFP	FTP
Network	Users and group access	**P**		**P**	**P**
	Host access	**P**	**P**		**P**
Advanced	Permissions for newly created files and folders	**P**	**P**	**P**	**P**
	Miscellaneous advanced settings	**P**			
File and folder	File and folder access	**P**	**P**	**P**	**P**

➢ **To set up the access rights for a share:**

1. Select **Shares**.
2. Click the **Data Set** button (with four cubes,).

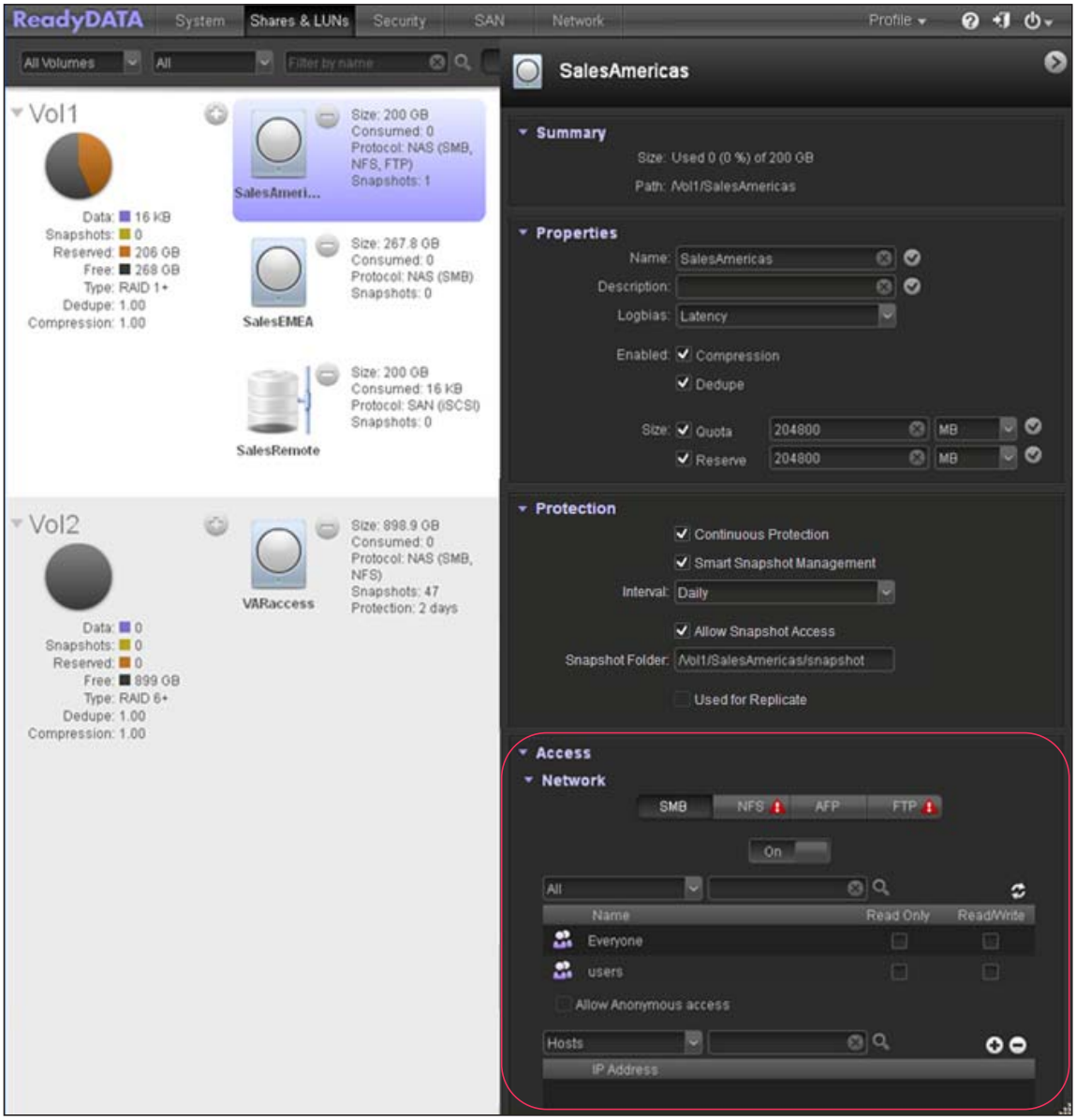
   The Shares screen displays (see the figure in *Step 3*).
3. Select the share that you want to explore by clicking it.

   The color of the share turns purple:



4. Click the screen **Expand** button ( ) on the top right of the screen.

The Properties pane displays:



5. Locate the Access section in the lower half of the Properties pane, and select one of the following buttons, each of which corresponds to a file-sharing protocol:
   - **SMB**
   - **NFS**
   - **AFP**
   - **FTP**

   The pane adjusts to display the access properties for the selected protocol.

6. Configure the access settings for the selected protocol as explained in the following sections (not all sections apply to all protocols):
   - *Configure the Network Access Settings* on page 84
   - *Configure the Advanced Access Settings* on page 87
   - *Configure the File and Folder Access Settings* on page 89
7. Set the On-Off switch for the selected protocol:
   - To apply the access settings, click the **On-Off** switch so the switch shows the **On** position.
   - To save the configured access settings but prevent them from taking effect, click the **On-Off** switch so the switch shows the **Off** position.

   Note: *The settings take effect immediately (that is, no Apply button exists to confirm the changes).*

Configure the Network Access Settings

The user and group access settings let you set access rights to an individual share for groups and users. The host access settings let you set access rights to an individual share for users on a host.

The table in the Network section displays either the groups and users that you defined in the local database or the ones that are downloaded from the Active Directory server. For information about the local database and an Active Directory connection, see *Chapter 5, Manage User Groups and User Accounts*.

The following figure shows the Network section on the Properties pane of a share (in this example, the SMB protocol is shown):

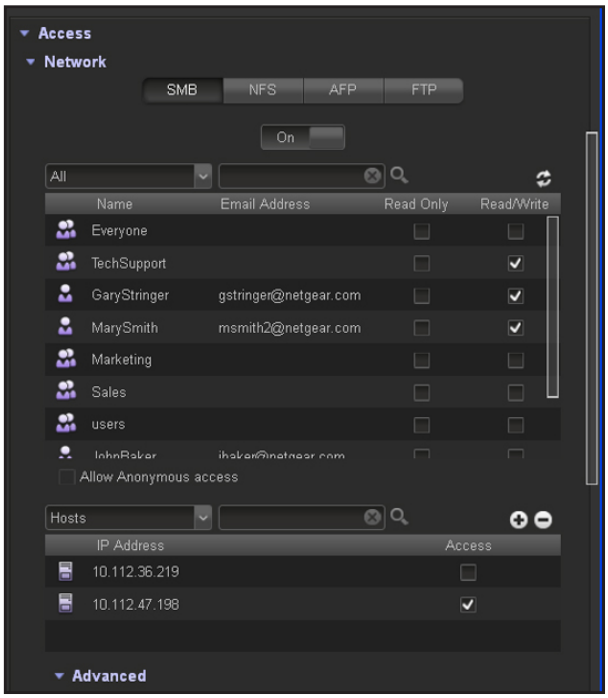


Figure 7. Network section of the share properties pane (SMB)

User and Group Settings

For SMB, AFP, and FTP, you can configure access rights for groups and individual users. User and group settings do not apply to NFS.

➢ **To configure user and group access settings:**

1. From the All drop-down list, make one of the following selections to specify the information that you want to display onscreen:
   - **All**. The default group Everyone and all groups that you configured on the Security screen or that were downloaded from the AD server are displayed. This is the default setting.
   - **Users**. Only the individual users that you configured on the Security screen or that were downloaded from the AD server are displayed.
   - **Groups**. Only the groups that you configured on the Security screen or that were downloaded from the AD server are displayed.

   To search for a particular user or group, use the search field on the right.

   To update the user and group information, click the **Refresh** button ( ).
2. For each group and individual user to which you want to grant access to the share, select one of the following check boxes:
   - **Read Only**. The selected user or group is permitted to only read files on the share.

- **Read/Write**. The selected user or group is permitted to read, edit, create, and delete files on the share.

Note: *If the ReadyDATA uses the local database, you can select the default group Everyone and set read-only or read/write access for everyone.*

3. (Optional for SMB and AFP). Allow anonymous access to the share.

   If the ReadyDATA uses the local database and you have granted the default group Everyone access, you can select the **Anonymous** check box to allow anonymous access to the share. In this situation, users are not required to provide access credentials.

Host Settings

For SMB, NFS, and FTP, you can configure access rights for users on hosts. The access rights that you configure for one host apply to all users on the host. For NFS, you can also configure the access rights that apply to any host, and, for individual hosts, you can configure whether root access is granted. Host settings do not apply to AFP.

If the table contains many hosts, use the search field on the right to search for a particular host.

➢ **To add a host and configure host access settings:**

1. To add the IP address of a host from which access can be granted, click the **+** button ().

   The Add Host pop-up screen displays.

2. Enter the host IP address in the IP address field.
3. Click **Add**.

   The host is added to the table.

   Note: *For NFS only, you can set access rights for AnyHost, which is a default entry in the host table. You cannot grant root access to AnyHost.*

4. For each host to which you want to grant access to the share, select one of the following check boxes:
   - **Read Only**. The users on the selected host are permitted to read only files on the share.
   - **Read/Write**. The users on the selected host are permitted to read, edit, create, and delete files on the share.
5. (Optional for NFS) For each host for which you want to grant the users root access, select the **Root Access** check box.

➢ **To remove a host:**

1. Select the host from the table by clicking it.
2. Click the **-** button ( ).
3. Confirm the removal.

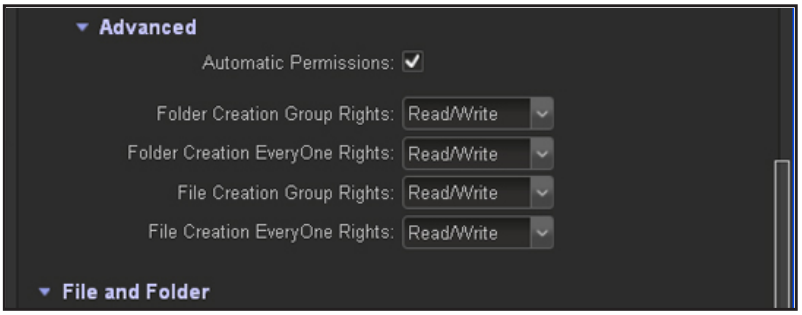
Configure the Advanced Access Settings

Configure Automatic Permissions

By default, a user with read/write access can create a file or folder on a share. Anyone with read/write access can change or delete the newly created file or folder. Anyone with read-only access can view the newly created file or folder. You can change these default settings for new files and folders on an individual share by configuring the automatic permissions.

Note: File and folder access settings now take precedence over automatic permissions. The Advanced section on the share or LUN Properties pane displays any automatic permissions that you previously configured, but new changes to these settings are not enforced. For more information about File and folder access settings, see *Configure the File and Folder Access Settings* on page 89.

The following figure shows the Advanced section on the Properties pane of a share:



➢ **To configure automatic permissions:**

1. Select the **Automatic Permissions** check box.

   The drop-down lists in the Advanced section are enabled.

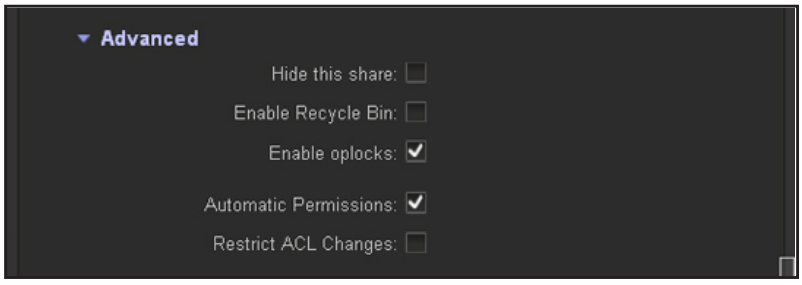
   By default, this check box is cleared, and the default access rights are automatically assigned to newly created folders and files. By setting automatic permissions, you can change these default access rights on an individual share.

2. Make selections from the drop-down lists as explained in the following table:

Item	Settings
Folder Creation Group Rights	Make a selection from the drop-down list: • **Disabled**. Members of a group cannot create or delete folders. • **Read-Only**. Members of a group have read-only access to a folder that is created by a member of the group. • **Read/Write**. Members of a group have read/write access to a folder that is created by a member of the group. This is the default setting.
Folder Creation Everyone Rights	Make a selection from the drop-down list: • **Disabled**. No one outside a group can create or delete folders. • **Read-Only**. Anyone outside the group in which a group member has created a folder has read-only access to the new folder. • **Read/Write**. Anyone outside the group in which a group member has created a folder has read/write access to the new folder. This is the default setting.
File Creation Group Rights	Make a selection from the drop-down list: • **Disabled**. Members of a group cannot create or delete files. • **Read-Only**. Members of a group have read-only access to a file that is created by a member of the group. • **Read/Write**. Members of a group have read/write access to a file that is created by a member of the group. This is the default setting.
File Creation Everyone Rights	Make a selection from the drop-down list: • **Disabled**. No one outside a group can create or delete files. • **Read-Only**. Anyone outside the group in which a group member has created a file has read-only access to the new file. • **Read/Write**. Anyone outside the group in which a group member has created a file has read/write access to the new file. This is the default setting.

Miscellaneous Advanced Access Settings for SMB Only

The following figure shows the top of the Advanced section that is specific to SMB on the Properties pane of a share. SMB supports these settings for an individual share *in addition* to the general advanced access settings for the individual share.



The following table explains the miscellaneous advanced options for SMB:

Table 8. Miscellaneous advanced options for SMB

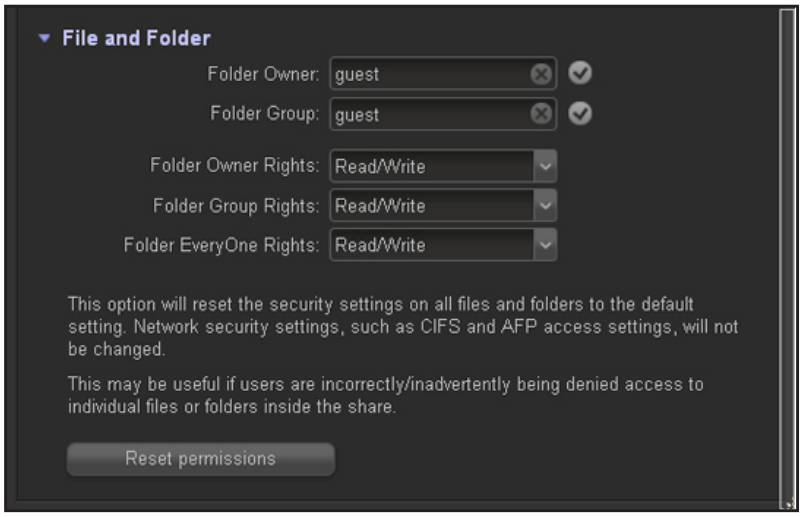
Item	Setting
Hide this share	Select this check box to prevent users from discovering the share unless they explicitly specify the share name in the browse path. By default, this check box is cleared.
Enable Recycle Bin	You cannot select the recycle bin. This is a feature that is not operational but that will be supported in a future release.
Enable oplocks	Select this check box to allow users to place opportunistic locks (oplocks), which can improve the traffic performance for the users by allowing files residing on the share to be cached locally on the client. By default, this check box is selected. **Note:** For shares on which both critical data transmissions and shared-file operations occur, NETGEAR recommends that you disable oplocks.
Automatic Permissions	Select this check box to enable the drop-down lists in the Advanced section. By default, this check box is cleared, and the default access rights are automatically assigned to newly created folders and files. By setting automatic permissions, you can change these default access rights on an individual share. For more information about the drop-down lists, see the previous section (*Configure Automatic Permissions* on page 87).
Restrict ACL Changes	Select this check box to prevent users with read/write access from changing file permissions such as file attributes and file ownership. By default, this check box is cleared.

Configure the File and Folder Access Settings

The file and folder access settings let you change the default rights for access to folders and their files on an individual SMB, AFP, NFS, or FTP share.

Note: File and folder access settings now take precedence over automatic permissions. The Advanced section on the share or LUN Properties pane displays any automatic permissions that you previously configured, but new changes to these settings are not enforced. For more information about automatic permissions, see *Configure Automatic Permissions* on page 87.

The following figure shows the File and Folder section on the Properties pane of a share:



The following table explains the file and folder access settings:

Table 9. File and folder access settings

Item	Setting
Folder Owner	You can assign a single user or the administrator as the folder owner. By default, the folder owner is set to guest.
Folder Group	You can assign a single group, a single user, or the administrator as the folder group. By default, the folder group is set to guest.
Folder Owner Rights	Make a selection from the drop-down list: • **Disabled**. The folder owner does not have access rights to a folder. • **Read-Only**. The folder owner has read-only access to a folder. • **Read/Write**. The folder owner has read/write access to a folder. This is the default setting.
Folder Groups Rights	Make a selection from the drop-down list: • **Disabled**. Members of a group have no access to a folder that is owned by a member of the group. • **Read-Only**. Members of a group have read-only access to a folder that is owned by a member of the group. • **Read/Write**. Members of a group have read/write access to a folder that is owned by a member of the group. This is the default setting.
Folder EveryOne Rights	Make a selection from the drop-down list: • **Disabled**. No one outside the group in which a group member owns a folder has access rights to the folder. • **Read-Only**. Anyone outside the group in which a group member owns a folder has read-only access to the folder. • **Read/Write**. Anyone outside the group in which a group member owns a folder has read/write access to the folder. This is the default setting.

To set all access rights to the files and folders in an individual share to default settings, click **Reset permissions**. After you have reset the access rights, owners, groups, and anyone else with access to the share has read/write access to all files and folders on the share.

Manage LUNs For Storage Area Networks

About LUNs

Each LUN has a configuration that is independent of other LUNs that reside on the same volume. A LUN configuration includes settings such as logbias, compression, deduplication (referred to as dedupe), protection, file-sharing protocols, provisioning, LUN size, and access rights. These settings are explained in the following sections.

The configuration settings of a LUN are stored in the volume (that is, in the pool) in which the LUN resides. This design allows a LUN to be portable when a disk is moved from one array to another array. However, iSCSI settings are *not* moved when you migrate a LUN from one volume to another volume or when you move the disk or disks on which the volume with the LUN resides to another array. (For information about how to configure the iSCSI settings, see *Manage Access Rights for LUN Groups* on page 107.)

You can specify whether a snapshot is created, and with what frequency it is created.

You can specify the size of a LUN in two ways:

- **Thin**. Even though you specify the size of a thin LUN when you create it, storage space is assigned on demand instead of up front. This method greatly improves the utilization rate of the LUN because storage space is assigned only as data is written to the LUN. However, the size of the LUN is reported as the total storage space that you specify when you create the LUN. As data is written to the LUN, the used storage space is displayed on the volume icon in purple.

  A thin LUN lets you overallocate its size, that is, you can assign a LUN size that is larger than the size of the volume. You can then expand the volume as needed (if necessary, adding disks in the process) without expanding the size of the LUN, and therefore without disconnecting users. Make sure that you watch the volume capacity of the volume on which the overallocated LUN resides so you do not run out of storage space unexpectedly.

  Note: *NETGEAR recommends that you do not use an overallocated LUN for storage of critical data. Instead, use a thick LUN.*

- **Thick**. All storage space that you specify when you create a thick LUN is also allocated up front, and the storage space is reserved on the volume. Snapshots, other LUNs, and shares on the volume cannot consume storage space that is reserved. The reserved storage space is displayed on the volume icon in orange. The size of the LUN is reported as the total storage space that you specify when you create the LUN. You cannot assign more storage space than the available nonreserved storage space on the volume. As data is written to the share, the used storage space is displayed on the volume icon in purple.

The following table explains the default settings of a LUN. You can change these settings when you create or change the LUN.

Table 10. LUN default settings

Item	Default State
Logbias[a]	Latency
Compression	Disabled
Dedupe	Disabled
Protection	Continuous
Interval	Daily
Provision	Thick
Size	No limitation
Access	Denied until you set permissions

a. You can change the logbias only when you change the properties of a share.

Create a LUN

After you create a volume (see *Create a Volume and Select the RAID Level* on page 23), you can create LUNs on that volume.

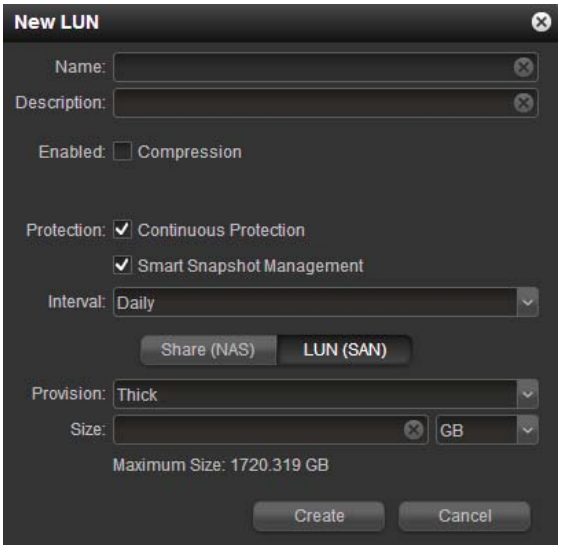
➢ **To create a LUN:**

1. Select **Shares**.
2. Click the **Data Set** button (with four cubes, ).

The Shares screen displays, showing the configured volumes on the left:

3. Click the **+** button ( ) to the right of the volume to which you want to add a LUN.

   The New LUN pop-up screen displays:



4. Configure the settings as explained in the following table:

Item	Description
Name	A unique name to identify the LUN. Do not include spaces in the name.
Description	An optional description to help identify the LUN.

Item	Description	
Compression	Select the **Compression** check box to enable data compression. Compression saves storage space and increases the speed of data transfers, but the compression and decompression processes require additional resources. By default, the Compression check box is cleared.	
Protection	Select the **Continuous Protection** check box to enable data protection through snapshots and configure the frequency at which snapshots are made. By default, the Continuous check box is selected. For more information about snapshots, see *Manage Snapshots for Shares and LUNs* on page 158.	
	Smart Snapshot Management	Select the **Smart Snapshot Management** check box to enable automatic snapshot pruning. When enabled, this feature deletes older snapshots so that hourly snapshots are kept for 48 hours, daily snapshots are kept for 4 weeks, weekly snapshots are kept for 8 weeks, and monthly snapshots are kept indefinitely.
	Interval	The interval specifies how often a snapshot is made. Make a selection from the drop-down list: • **Hourly**. A snapshot is taken every hour on the hour. • **Daily**. A snapshot is taken every day at midnight. This is the default setting. • **Weekly**. A snapshot is taken every week on Friday at midnight.
LUN (SAN)	Click the **LUN (SAN)** button. (Clicking the Share (NAS) button creates a share; see *Create a Share* on page 70.)	
Provision	Select how storage space is provisioned. Make a selection from the drop-down list: • **Thin**. Even though you specify the size of the LUN when you create it, storage space is assigned on demand instead of up front. The size of the LUN is reported as the total storage space that you specify when you create the LUN. • **Thick**. All storage space that you specify when you create the LUN is also allocated up front. The size of the LUN is reported as the total storage space that you specify when you create the LUN. This is the default method. **Note:** Make sure that you watch the volume capacity of the volume on which the overallocated LUN resides so you do not run out of storage space unexpectedly. **Note:** NETGEAR recommends that you do not use an overallocated thin LUN for storage of critical data. Instead, use a thick LUN.	
Size	Specify the size of the LUN. The maximum size that you can allocate to the LUN is stated at the bottom of the screen.	
	Unit	Select the unit of measurement from the drop-down list: • **MB**. • **GB**. This is the default unit of measurement. • **TB**.

5. Click **Create**.

   The ReadyDATA confirms the creation of a LUN with the message “Data Set successfully created.” The new LUN is added to the Shares screen. Basic information is displayed to the right of the LUN.

View and Change the Properties of a LUN, Including Size Expansion

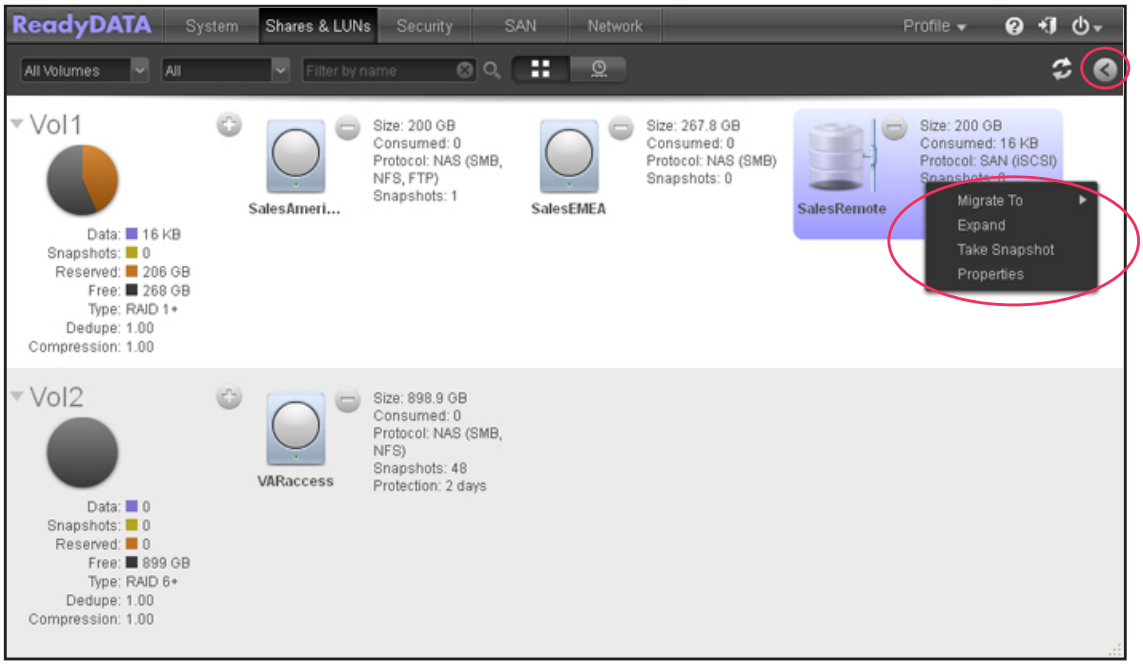
➢ **To view and change the properties of a LUN:**

1. Select **Shares**.
2. Click the **Data Set** button (with four cubes,).

   The Shares screen displays (see the figure in *Step 4*).
3. Select the LUN that you want to explore by clicking it.

   The color of the LUN turns purple.
4. Right-click the LUN.

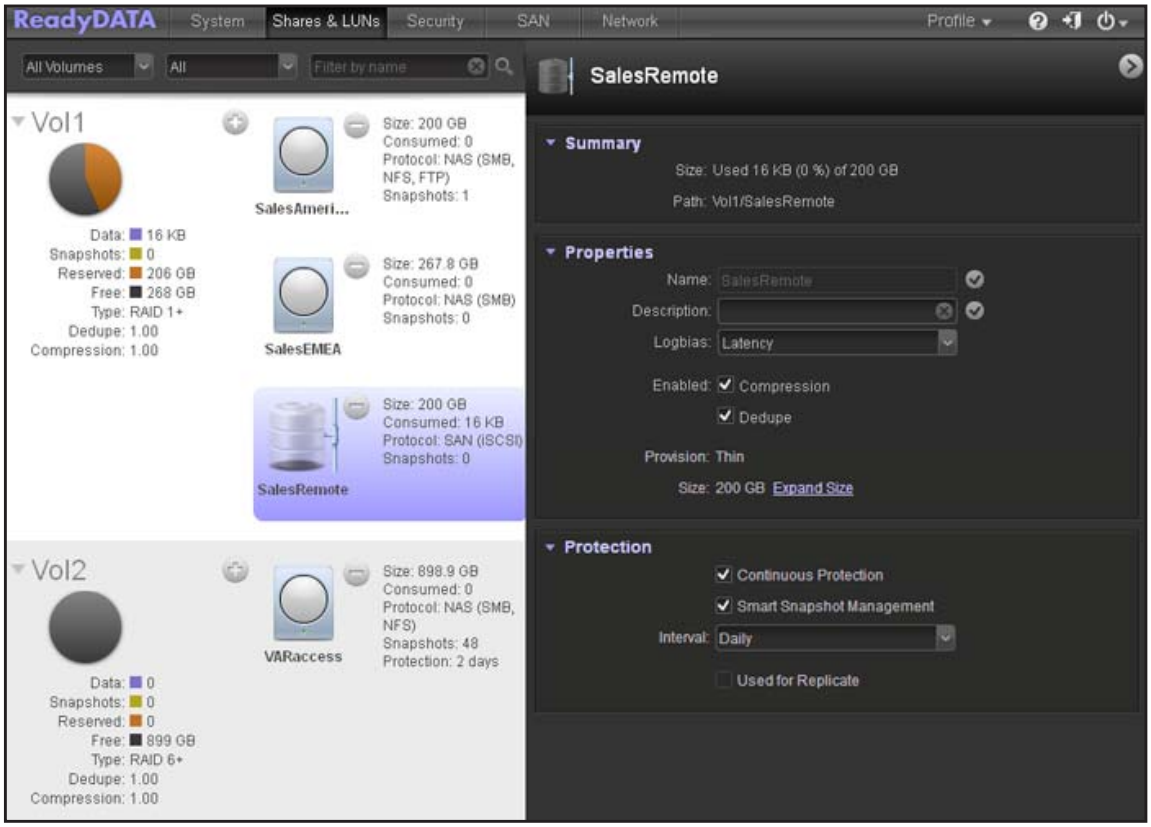
   A pop-up menu displays:



5. Select **Properties**.

   The Properties pane for the selected LUN displays at the right of the screen (see the next figure).

Note: You can also use a shortcut to display the Properties pane of a LUN. Click the screen **Expand** button ( ) on the top right of the screen to display the Properties pane (see the red oval on the top right of the previous figure). Click the same button (which now appears as a reversed arrow) again to hide the Properties pane.



6. Change the settings as explained in the following table. Click the flag button ( ) to save any changes in a field or drop-down list.

Item	Description
Summary	
Size	The size is provided for information only. For information about how to expand the size of an existing LUN, see *Expand the Size of a LUN* on page 98.
Path	The path is provided for information only.
Properties	
Name	A unique name to identify the LUN. Do not include spaces in the name.
Description	An optional description to help identify the LUN.
Logbias	Change the logbias setting by making a selection from the Logbias drop-down list: • **Latency**. Data requests are handled at high priority with a minimum of delay, but data throughput might not be optimum. This is the default setting that is automatically assigned when you create a share. • **Throughput**. Data requests are handled with high data throughput, but there might be delay in response to requests.

Item	Description	
Compression	Select the **Compression** check box to enable data compression. Compression saves storage space and increases the speed of data transfers, but the compression and decompression processes require additional resources.	
Dedupe	Select the **Dedupe** check box to enable deduplication, which prevents storage of redundant data on the share. Unique data is stored only once on the share, and other instances of the identical data are removed and replaced by a pointer to the unique data. This storage method saves storage space and increases the speed of data transfers. By default, the Dedupe check box is cleared. **Note:** You can enable deduplication for a thin LUN but not for a thick LUN. **Note:** NETGEAR does not recommend enabling deduplication for performance-sensitive data on applications such as virtual machines and databases.	
Provision	The provision setting is provided for information only. You cannot change the provision setting of an existing LUN.	
Size	For information about how to expand the size of an existing LUN, see *Expand the Size of a LUN* on page 98.	
Protection		
Continuous Protection	Select the **Continuous Protection** check box to enable data protection through snapshots and configure the frequency at which snapshots are made. By default, the Continuous check box is selected. For more information about snapshots, see *Manage Snapshots for Shares and LUNs* on page 158.	
	Smart Snapshot Management	Select the **Smart Snapshot Management** check box to enable automatic snapshot pruning. When enabled, this feature deletes older snapshots so that hourly snapshots are kept for 48 hours, daily snapshots are kept for4 weeks, weekly snapshots are kept for 8 weeks, and monthly snapshots are kept indefinitely. **Note:** For shares or LUNs that were created before the release of this feature, Smart Snapshot Management is disabled by default.
	Interval	The interval specifies how often a snapshot is made. Make a selection from the drop-down list: • **Hourly**. A snapshot is taken every hour on the hour. • **Daily**. A snapshot is taken every day at midnight. This is the default setting. • **Weekly**. A snapshot is taken every week on Friday at midnight.

Note: The changes that you make on the Properties pane take effect immediately (that is, no Apply button exists to confirm the changes).

For information about how to set access right for a LUN, see *Assign LUNs to LUN Groups and Manage Access Rights* on page 103.

Expand the Size of a LUN

After you create a LUN, you cannot change the provision setting (thin or thick), but you can expand the size of the LUN.

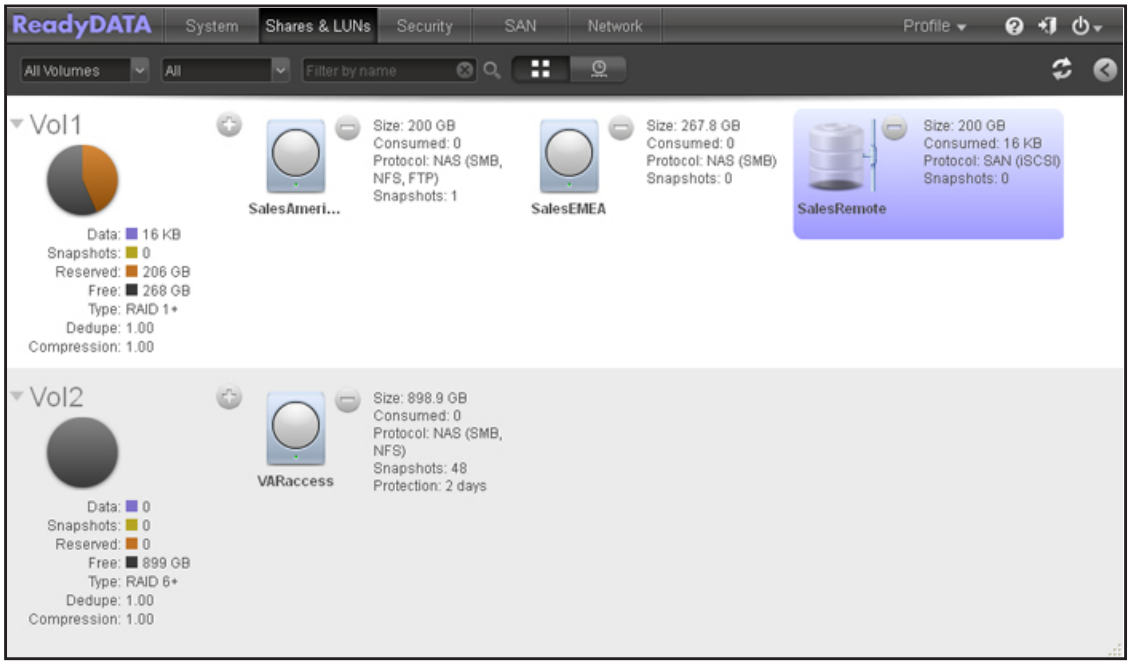
Expansion is instant, regardless of the data size, but you first need to disconnect all users that are connected to the LUN. You do this by removing the LUN from the LUN group to which the users have access (see *Assign a LUN to a LUN Group* on page 103).

➢ **To expand the size of a LUN:**

1. Select **Shares**.
2. Click the **Data Set** button (with four cubes, ).

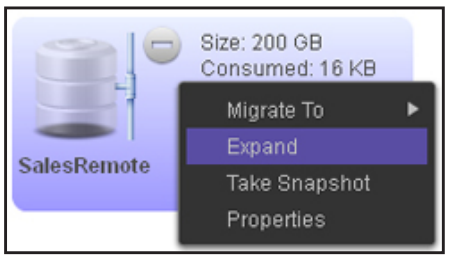
   The Shares screen displays (see the figure in *Step 3*).
3. Select the LUN for which you want to expand the size.

   The color of the LUN turns purple:



4. Right-click a share or LUN.

   A pop-up menu displays:



5. Select **Expand**.

   The Expand LUN pop-up screen displays:

6. Enter the following settings:
   - **New Size**. Specify the new size of the LUN. The maximum size that you can allocate to the LUN is stated above the New Size field.
   - **Unit**. Select the unit of measurement from the drop-down list (MB, GB, or TB).
7. Click **Expand**.

   The new LUN size takes effect.
8. Add the LUN to the LUN group to which it belonged before the expansion.

   See *Assign a LUN to a LUN Group* on page 103.

   User access to the LUN is restored.

Note: You can also expand a LUN from the Properties pane by clicking the **Expand size** link on the Properties pane.

Migrate a LUN to Another Volume

Migrating a LUN to another volume allows you to reorganize a volume or remove the LUNs from a volume before deleting the volume.

WARNING:

Migrating a LUN to another volume causes all users to be disconnected from the LUN.

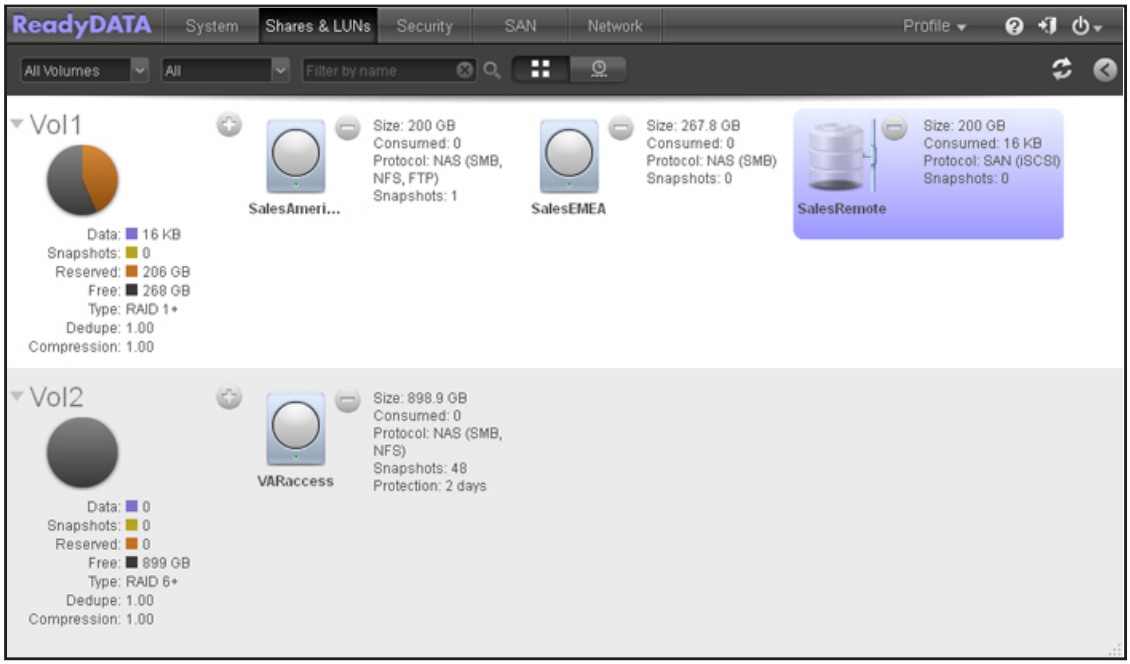
Note: A cloned LUN cannot be migrated to a volume that does not contain its parent. For more information about clones, see *Clone a Snapshot* on page 165.

➢ **To migrate a LUN to another volume:**

1. Select **Shares**.
2. Click the **Data Set** button (with four cubes,).

   The Shares screen displays (see the figure in *Step 3*).
3. Select a LUN by clicking it.

   The color of the LUN turns purple:

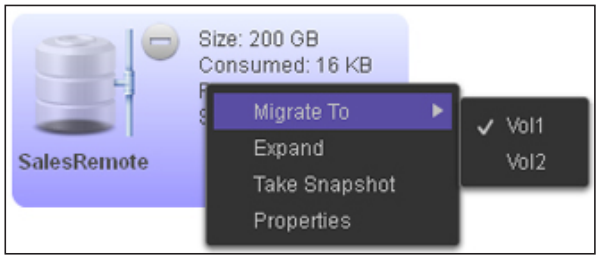


4. Right-click the share.

A pop-up menu displays (see the figure in *Step 5*).

5. Select **Migrate To**.

   A second pop-up screen displays the volumes:



   By default, the volume on which the share resides is flagged.

6. Select the name of the destination volume.
7. Confirm the migration.

   A progress circle ( ) displays the progress of the migration.

Delete a LUN

WARNING:

Deleting a LUN permanently removes the data within that LUN.

Note: A LUN that is the parent of a clone cannot be deleted. To delete the parent LUN, you must first delete all of its clones. For more information about clones, see *Clone a Snapshot* on page 165.

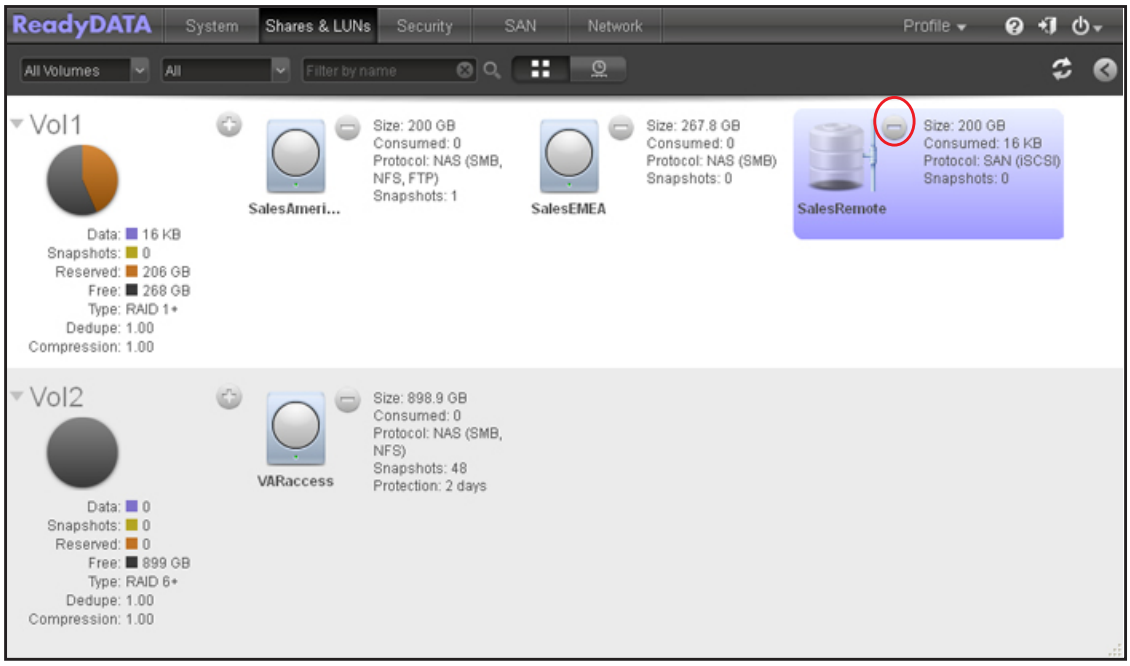
➢ **To delete a LUN from a volume:**

1. Select **Shares**.
2. Click the **Data Set** button (with four cubes,).

   The Shares screen displays (see the figure in *Step 3*).

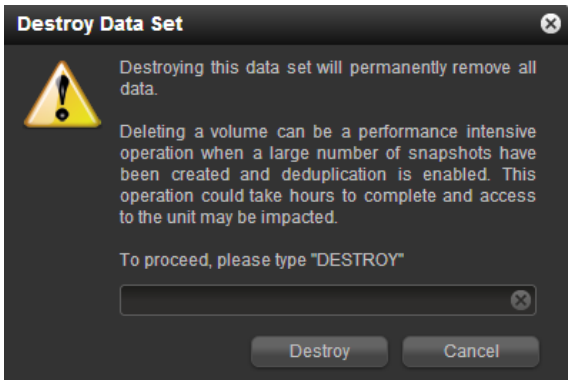
3. Select a LUN by clicking it.

The color of the LUN turns purple:



4. Click the **-** button ( ) to the right of the LUN.

   A pop-up screen displays.



5. Confirm the deletion by typing **DESTROY** into the field.
6. Click **Destroy**.

   The LUN is deleted.

Assign LUNs to LUN Groups and Manage Access Rights

- *Assign a LUN to a LUN Group*
- *Manage Access Rights for LUN Groups*

LUN groups allow you to organize LUNs and manage access rights to LUN groups. Access rights are either open or granted through internal CHAP authentication and apply to LUN groups, not to individual LUNs. However, you can easily assign a LUN to a LUN group, or move a LUN from one LUN group to another LUN group.

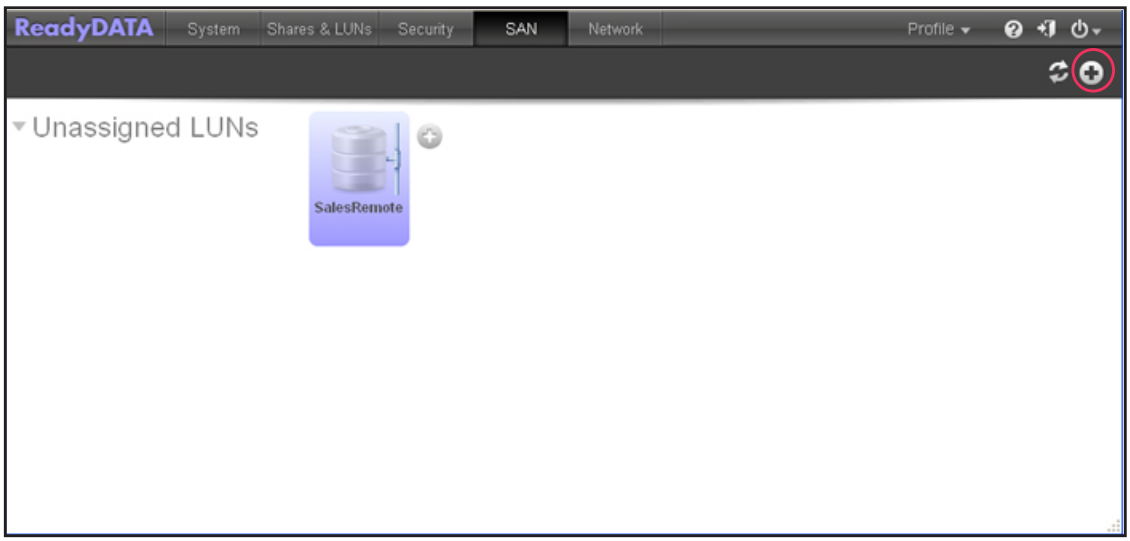
Each LUN group has an iSCSI target address (for example, iqn.1994-11.com.netgear:f2f2fdd4) that allows iSCSI clients to access the LUN group. For more information, see *Access a Share from Network-Attached Device* on page 111.

Assign a LUN to a LUN Group

➢ **To create a LUN group and assign a LUN to it:**

1. Select **SAN**.

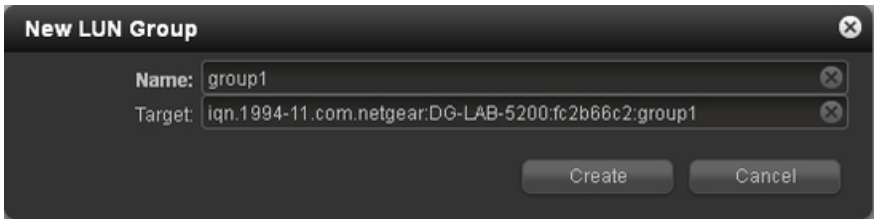
   The SAN screen displays the LUNs that you have created (see *Create a LUN* on page 92):



   When you create a LUN, the LUN is unassigned. You need to create a LUN group and assign one or more LUNs to the LUN group.

2. To create a LUN group, click the **+** button ( ) in the upper right of the screen.

The New LUN Group pop-up screen displays:



3. In the Name field, enter a name for the LUN group.

   The default name is groupX, in which X is a number in sequential and ascending order.

   The Target field is automatically populated. The target is the string that an iSCSI client needs to be able to connect to the LUN.

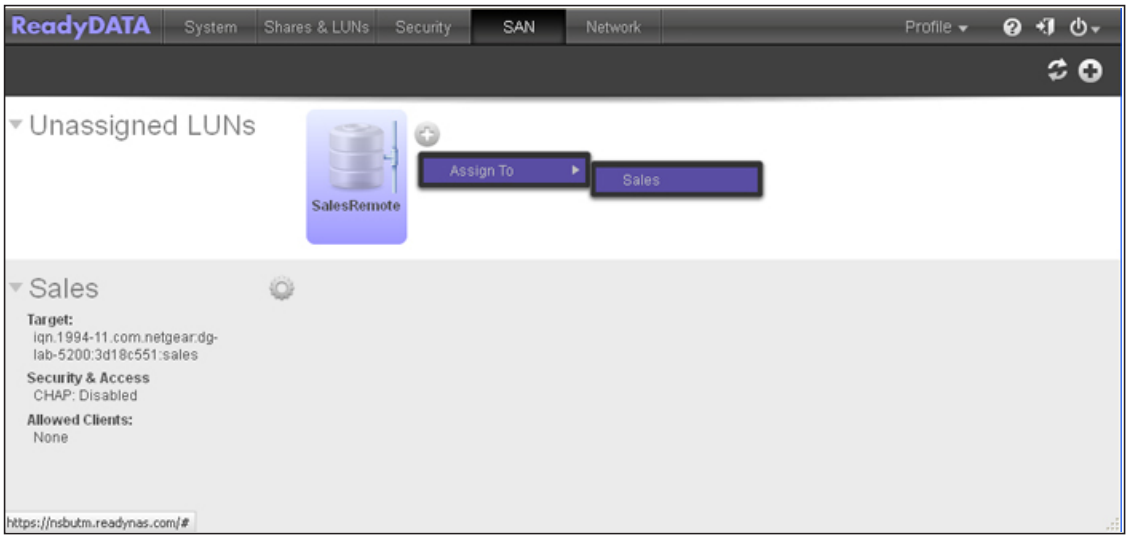
4. Click **Create**.

   The New LUN group is added to the SAN screen (see the following figure). By default, CHAP is disabled and no client is allowed to access the LUN group (for more information, see *Manage Access Rights for LUN Groups* on page 107).

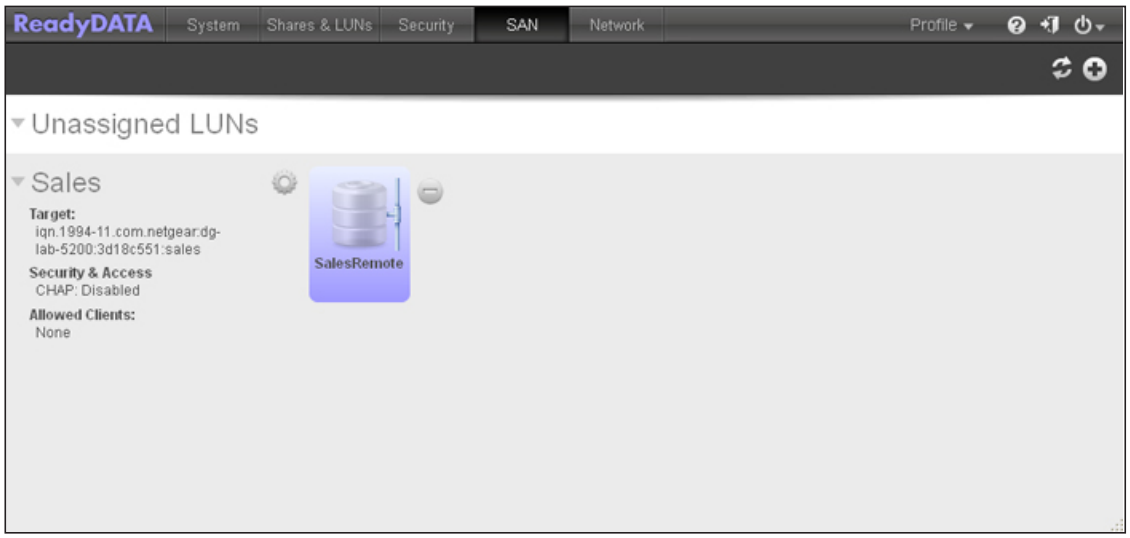
5. To assign a LUN to the newly created LUN group, click the **+** button ( ) to the right of an unassigned LUN.

   The Assign to pop-up menu displays.

6. Select **Assign to** (or hover your cursor over **Assign to**), and select a LUN group from the submenu:



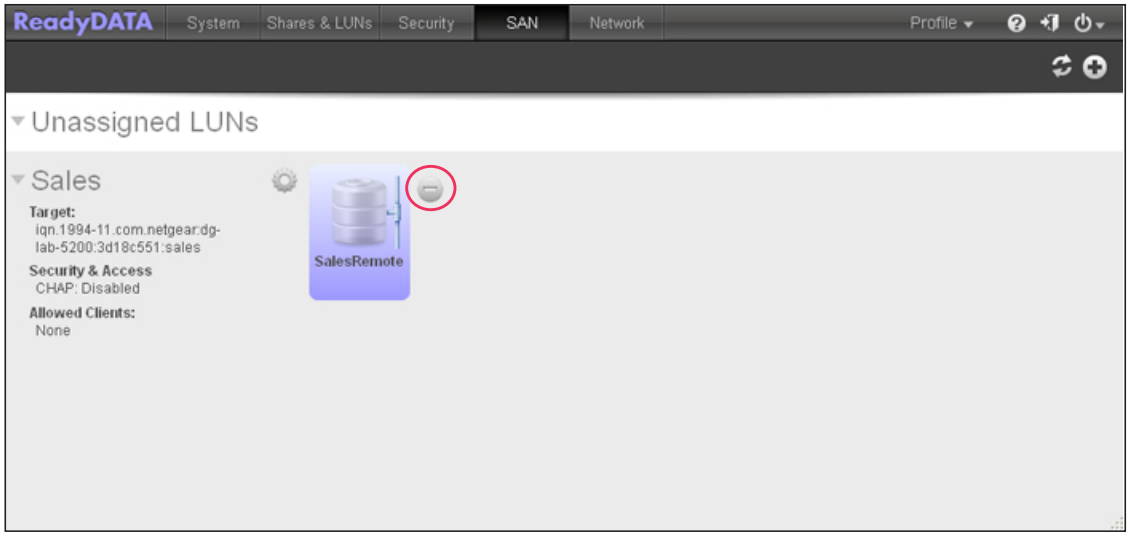
The LUN is now assigned to the selected LUN group:



➢ **To remove a LUN from a LUN group:**

1. Select **SAN**.

   The SAN screen displays:



2. Click the **-** button ( ) to the right of the LUN.
3. Confirm the LUN exclusion from the group.

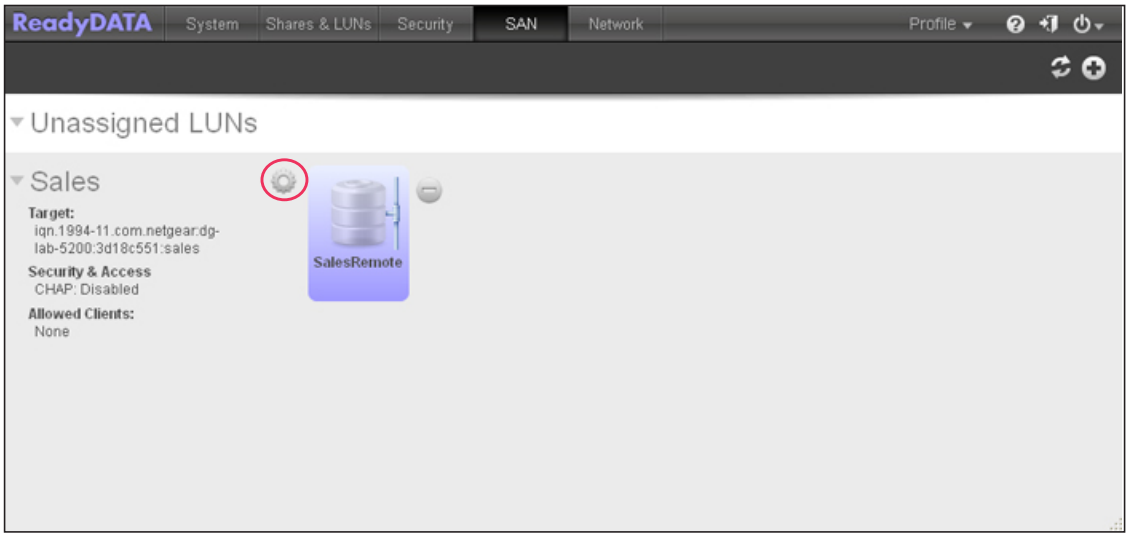
   The LUN is returned to the unassigned state.

➢ **To remove a LUN group:**

> **Note:** You cannot remove a LUN group that has a LUN assigned to it. You first need to remove the LUN from the LUN group.

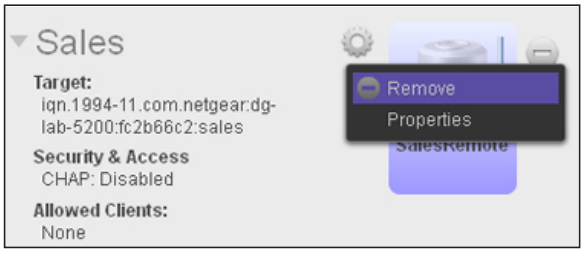
1. Select **SAN**.

   The SAN screen displays:



2. Click the gear icon to the right of the LUN group.

   A pop-up menu displays:



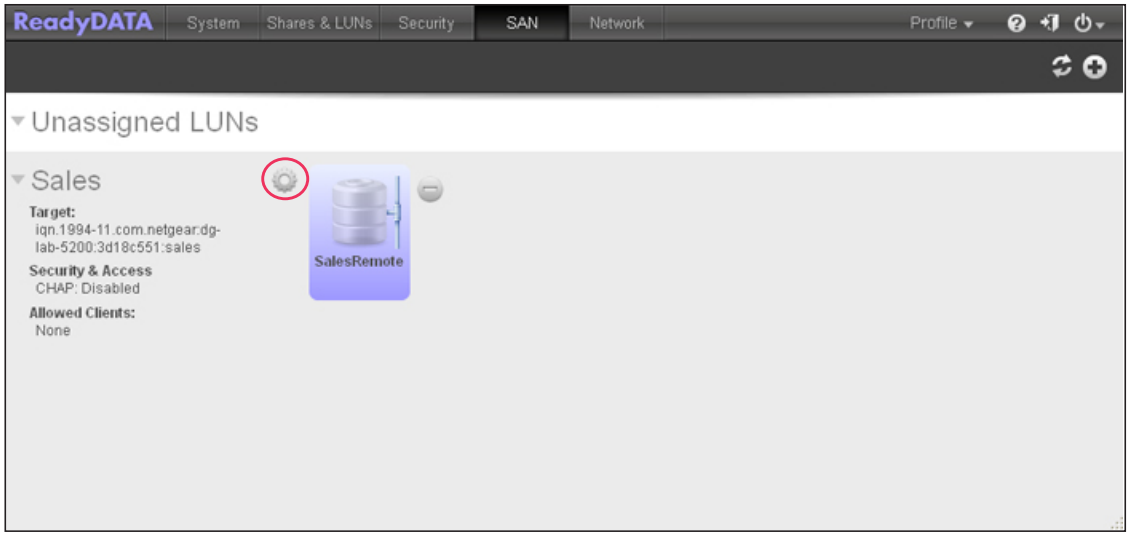
3. Select **Remove**.
4. Confirm the removal.

Manage Access Rights for LUN Groups

➢ **To configure client access to a LUN group:**

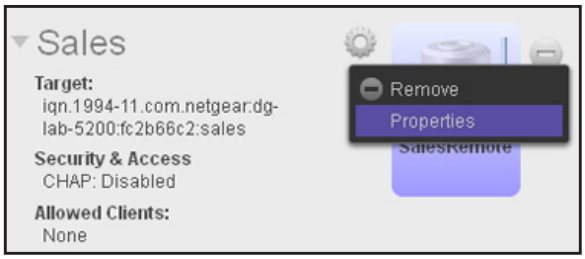
1. Select **SAN**.

   The SAN screen displays:



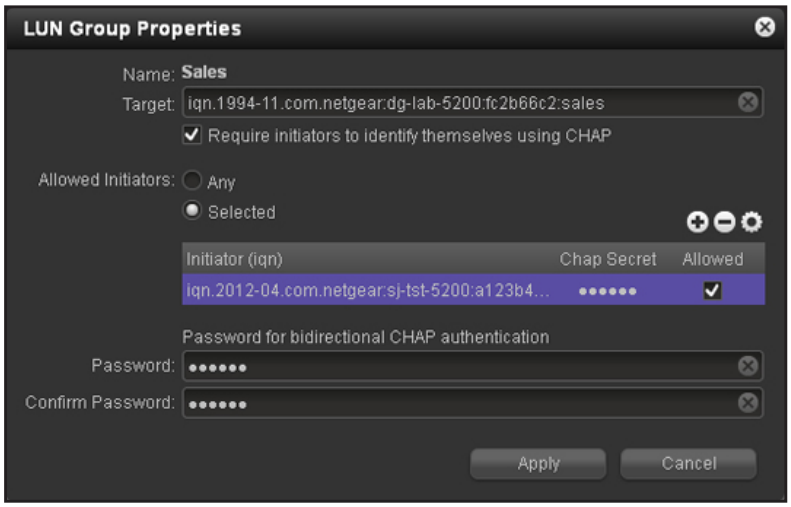
2. Click the gear icon to the right of the LUN group.

   A pop-up menu displays:



3. Select **Properties**.

The LUN Group Properties pop-up screen displays (the following figure shows examples):



4. Configure the properties as explained in the following table:

Item	Description	
Name	The name is provided for information only and cannot be changed.	
Target	The target is the address that an iSCSI client (that is, an initiator) needs to access the LUN group. The Target field is automatically populated, but you can delete the content by clicking the cross at the right of the field and then replace the content with a custom target address.	
	Require initiators to identify themselves using CHAP	By default, access to the LUN group is open to the initiators that you add to the table onscreen. Select this check box to enable CHAP authentication, and to allow only authenticated initiators access to the LUN group.

<table>
<tr><th>Item</th><th colspan="2">Description</th></tr>
<tr><td>Allowed Initiators</td><td colspan="2">Select one of the following radio buttons:
• Any. Access to the LUN group is granted to all initiators that have information about the target address. (If CHAP authentication is enabled, access is dependent on CHAP authentication.)
• Selected. Access to the LUN group is granted to iSCSI qualified names (IQNs) only. (If CHAP authentication is enabled, access is dependent on CHAP authentication.)
To add an IQN to the table and allow access to the LUN group:
1. Click the + button to the right of the empty table.
The Create initiator pop-up screen displays:
 
</td></tr>
<tr><td>Allowed Initiators (continued)</td><td colspan="2">2. In the Name field, enter an IQN in the format as defined by RFC3720.
For example, iqn.2012-04.com.netgear:sj-tst-5200:a123b456.
3. Enter a CHAP password with a length of at least 12 characters.
4. Confirm the CHAP password.
5. Click Create.
The IQN is added to the table on the LUN Group Properties pop-up screen.
6. In the Allowed column of the table, select (that is, flag) the check box to allow the initiator access to the LUN group.
To remove an IQN from the table:
1. Select the IQN by clicking it in the table.
2. Click the - button.
3. Confirm the removal.
To edit the CHAP password for an IQN in the table:
1. Select the IQN by clicking it in the table.
2. Click the wheel button.
3. Make the password changes
4. Click Apply.</td></tr>
<tr><td rowspan="3">Password for bidirectional CHAP authentication</td><td colspan="2">By default, access to an initiator by a LUN in the LUN group is open. To require a LUN in the LUN group to be authenticated before accessing an initiator, set a password for bidirectional CHAP authentication.</td></tr>
<tr><td>Password</td><td>Enter a CHAP password with a length of at least 12 characters.</td></tr>
<tr><td>Confirm Password</td><td>Confirm the CHAP password.</td></tr>
</table>

5. Click **Apply**.

The new LUN group properties take effect immediately.

For information about how to set up and access a LUN from a client device, see *Access LUN Groups from an iSCSI-Attached Device* on page 114.

Access a Share from Network-Attached Device

Users access shares and snapshots on the ReadyDATA from their network-connected devices, using the SMB, AFP, NFS, or FTP file-sharing protocol, depending on their device, the file-sharing protocols that you enabled for share access (see *Create a Share* on page 70), and the access rights that you granted (see *Set Up Access Rights to Shares* on page 80).

Users can employ any backup application to back up local data from their network-attached device to a share on the ReadyDATA.

Note: For snapshots to be accessible to users from their network-attached devices, you need to select the **Allow snapshot access** check box in the Protection section of the Properties pane of a share. For more information, see *View and Change the Properties of a Share* on page 73.

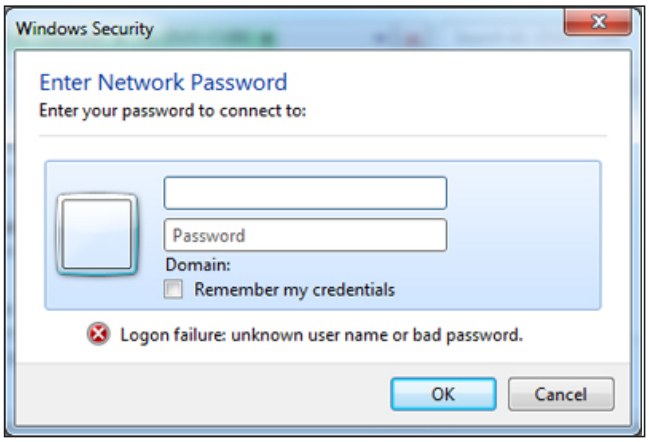
Use a Windows Device

Users can access shares on the ReadyDATA using a network-attached Windows-based device.

➢ **To access an SMB share using a network-attached Windows device:**

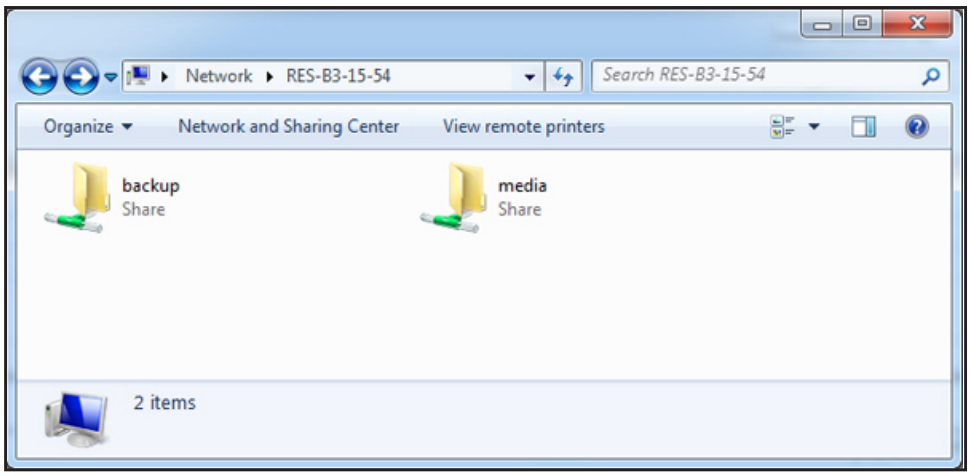
1. In the Windows Explorer address bar, enter the IP address or host name of the ReadyDATA:

You are prompted to log in to the ReadyDATA:



2. Enter a user name and password.

   Windows Explorer displays the contents of all available shares on the ReadyDATA:



Use a Mac OS X Device

Users can access shares on the ReadyDATA using a network-attached OS X device.

➢ **To access an AFP or SMB share using a network-attached OS X device:**

1. In Finder, select **Go > Connect to Server**.

   The Connect to Server dialog screen displays.

2. Connect to the ReadyDATA using either AFP or SMB:
   - **AFP**. Enter either one of the following commands in the Server Address field:

     afp://<*ip address*>

     or

     afp://<*host name*>

- **SMB**. Enter either one of the following commands in the Server Address field:

  smb://<*ip address*>

  or

  smb://<*host name*>

  <*ip address*> is the IP address of the ReadyDATA.

  <*host_name*> is the host name of the ReadyDATA.

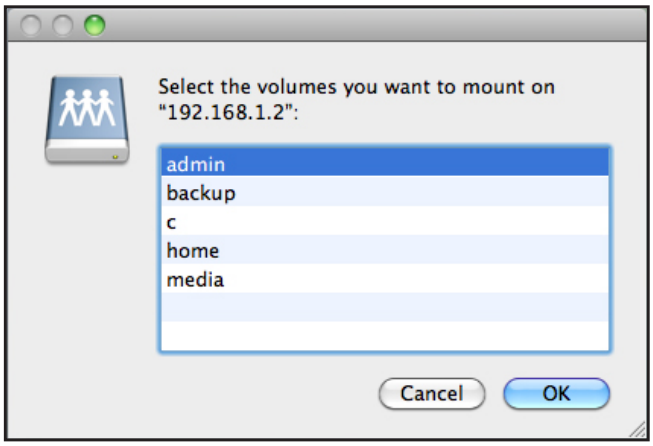
3. Click the **Connect** button.

   You are prompted to log in to your ReadyDATA.

4. Enter a user name and password.

   You are prompted to select a volume.

   Note: *Mac OS X calls ReadyDATA shares volumes.*



5. Select a volume or volumes (that is, share or shares on the ReadyDATA).
6. Click the **OK** button.

   Finder displays the contents of the share or shares in a window.

Use a Linux or Unix Device

You can access shares on the ReadyDATA using a network-attached Linux or Unix device that supports the SMB or NFS file-sharing protocol.

➢ **To access an SMB share using a network-attached Linux or Unix device:**

Using a terminal program, enter the following command:

mount [-t smb -o username=<*user name*>**,password=**<*password*>**]**
<*//ReadyDATA IP address*>*/*<*share name*> <*mount point*>

- <*user name*> and <*password*> match the user name and password on the ReadyDATA.
- <*ReadyDATA IP address*> is the IP address of the ReadyDATA.
- <*share name*> is the name of the share that you want to access.
- <*mount point*> is the name of an empty folder on the Linux or Unix device.

➢ **To access an NFS share using a network-attached Linux or Unix device:**

Using a terminal program, enter the following command:

mount [-t nfs -o username=<*user name*>**,password=**<*password*>**]**
//<*ReadyDATA IP address*>/<*volume name*>/<*share name*> <*mount point*>

- <*user name*> and <*password*> match the user name and password on the ReadyDATA.
- <*ReadyDATA IP address*> is the IP address of the ReadyDATA.
- <*volume name*> is the name of the volume on which the share resides.
- <*share name*> is the name of the share that you want to access.
- <*mount point*> is the name of an empty folder on the Linux or Unix device.

Access LUN Groups from an iSCSI-Attached Device

An iSCSI initiator application lets you set up a connection from a server to a LUN group (and therefore to individual LUNs). Normally, users would not initiate such a LUN connection; the network administrator would provide access to a LUN group through a server.

The iSCSI targets (that is, the LUNs in the LUN group on the ReadyDATA) present themselves on the client system as virtual block devices and can be treated as a locally attached disks. Windows, for instance, can run FAT32 or NTFS on the iSCSI target device, and treat the devices as though they are locally attached.

When they have access to a LUN group, users can employ any backup application to back up local data from their iSCSI-attached device to a LUN.

Note: Unlike snapshots that reside on a share, snapshots that reside on a LUN are not visible to users. For information about how to recover data using a snapshot on a LUN, see *Recover Data from a Snapshot to an iSCSI-Attached Device* on page 172.

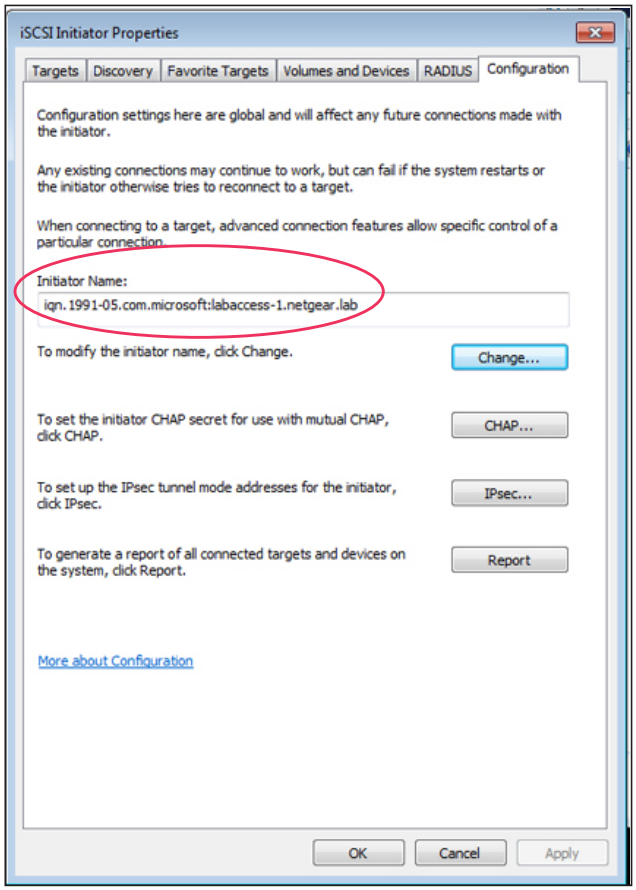
Access LUN Groups using Microsoft iSCSI Software Initiator

The following procedure uses the Microsoft iSCSI Software Initiator, which is freely available online and is integrated in Windows 7.

Note: If you use another operating system than Windows, the steps are different, but the basic tasks remain the same.

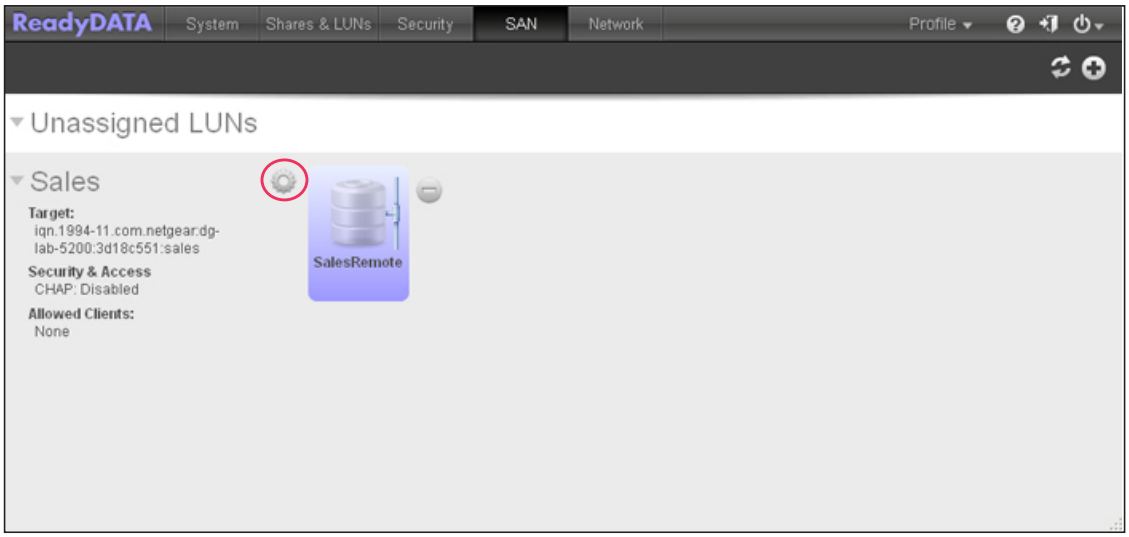
➢ **To configure LUN access through an iSCSI initiator:**

1. Open the iSCSI initiator and click the **Configuration** tab.
2. Copy the default name from the Initiator Name field.



3. On the ReadyDATA Dashboard, click **SAN**.

The SAN screen displays:

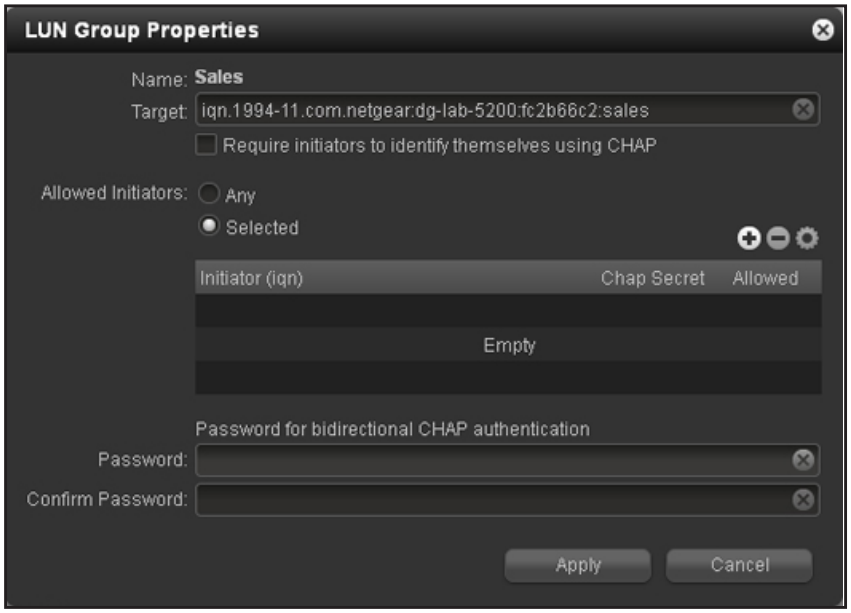


4. Click the gear icon to the right of the LUN group to which you want to connect the server.

   A pop-up menu displays.

5. Select **Properties**.

   The LUN Group Properties pop-up screen displays:

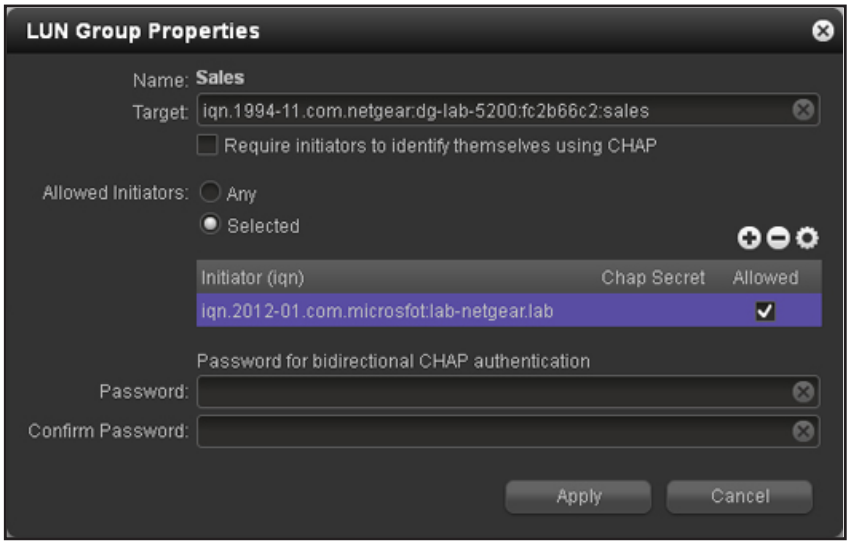


6. Next to Allowed Initiators, select the **Selected** radio button.
7. Click the **+** button to the right of the empty table.

The Create initiator pop-up screen displays:

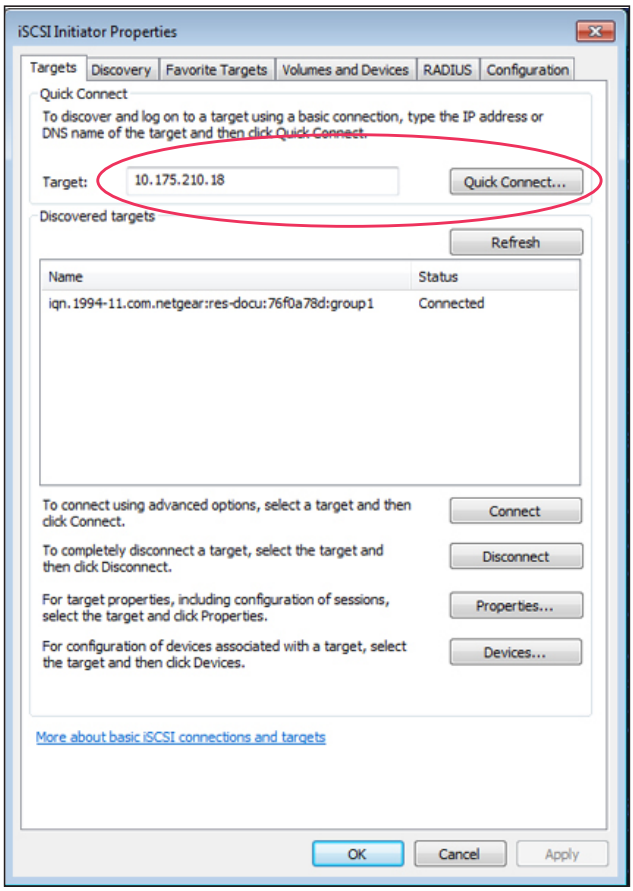
8. Paste the default iSCSI initiator name in the Name field.
9. Click **Create**.

   The LUN Group Properties pop-up screen displays again and the initiator is added to the table on the LUN Group Properties pop-up screen.
10. On the LUN Group Properties screen, next to the iSCSI initiator name, select the **Allowed** check box:



11. Click **Apply**.

12. On the iSCSI Initiator Properties screen, click the **Targets** tab:



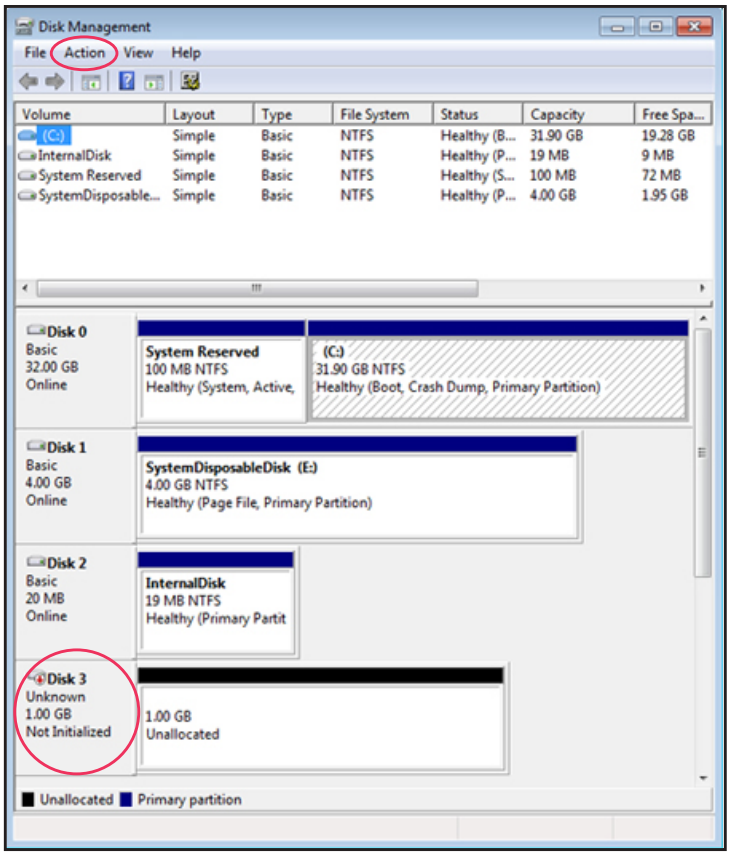
13. In the Target field, enter the IP address of the ReadyDATA.
14. Click **Quick Connect**.

    The server connects to the LUN group on the ReadyDATA, but the LUNs in the LUN group cannot yet be displayed in Windows Explorer.

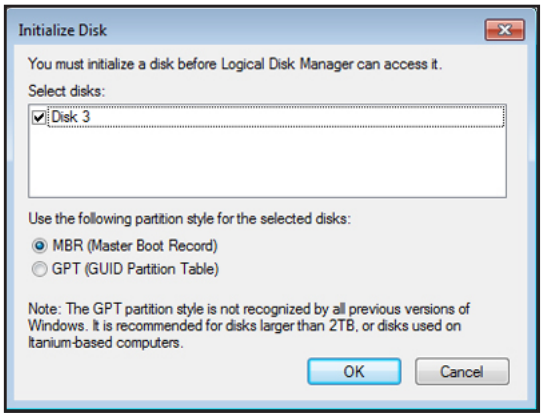
15. Open the Windows Disk Management application.

    Each LUN in the LUN group displays as an unallocated disk that needs to be initialized and formatted.

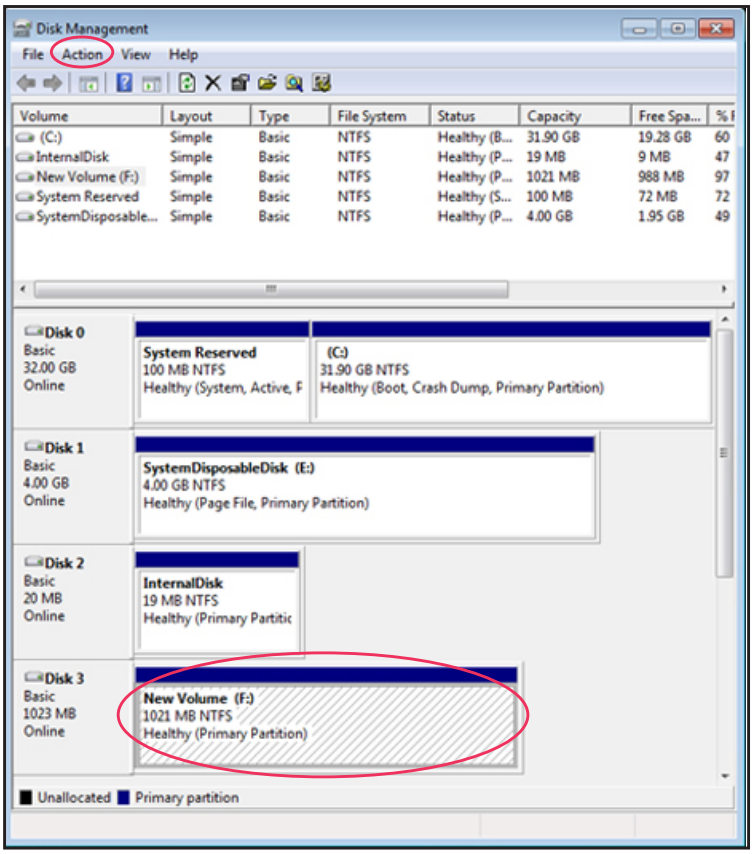
    Tip: If the disks do not display, select **Action > Refresh** from the Disk Management menu.



16. Initialize each new disk by selecting **Action > All Tasks > Initialize Disk** from the Disk Management menu.



17. Format each new disk.
    a. Select the disk that you want to format.
    b. Select **Action > All Tasks > New Simple Volume** from the Disk Management menu.



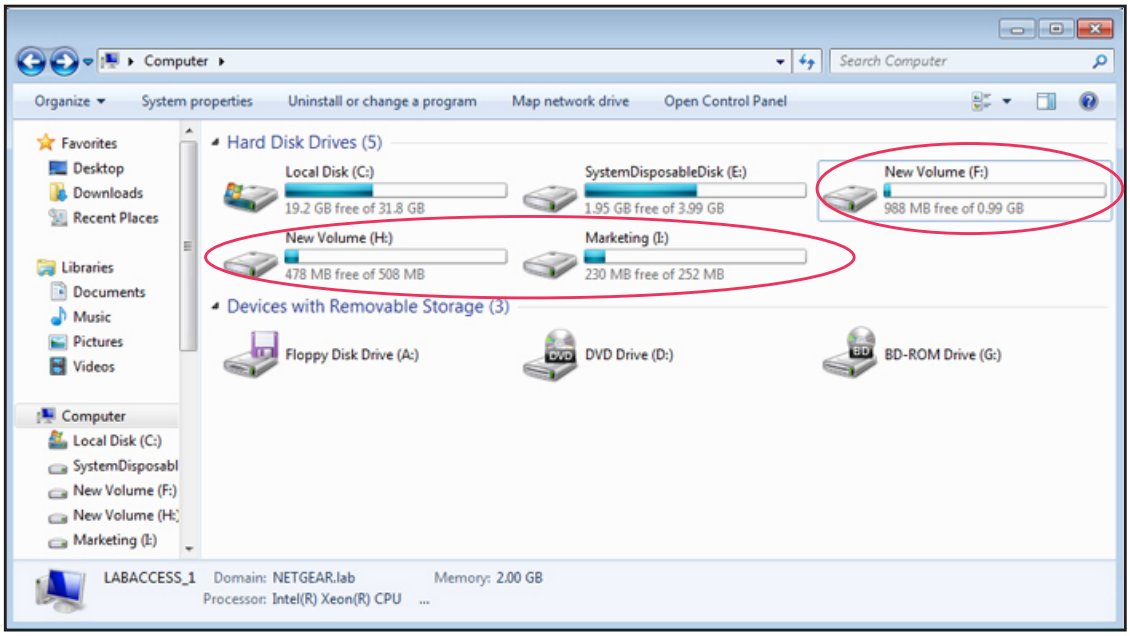
The New Simple Volume Wizard pop-up screen displays.

c. Follow the default wizard formatting steps.

Alternately, you can give the volume label for the new disk that represents the LUN the same name as the LUN.

The LUNs are now accessible as hard disk drives (referred to as new volumes if you kept the default volume label) through Windows Explorer.

The following figure shows three LUNs: New Volume (F:), New Volume (H:), and Marketing (I:):



Manage User Groups and User Accounts

5

This chapter describes how to configure the global security access mode and how to create and manage user accounts. It contains the following sections:

- *About Security, User Groups, and Users*
- *Configure the Global Security Access Mode*
- *Manage User Groups for the Local Database*
- *Manage User Accounts for the Local Database*

Note: Without at least one volume, changes are not saved after you reload the ReadyDATA. Make sure that you create a volume before you configure users groups and users accounts. For information about how to configure volumes, see *Chapter 2, Manage Disks and Volumes*.

About Security, User Groups, and Users

The security settings determine which users can access a share, and if they have read-only or read/write access to the share. However, before you can set security settings at the share level, you first need to configure the global security settings that determine whether the ReadyDATA uses its local user database or an Active Directory.

Note: Access to LUNs is *not* regulated by the local user database or an Active Directory. For information about LUN access options, see *Assign LUNs to LUN Groups and Manage Access Rights* on page 103.

The local database lets you manage up to 60,000 users and up to 60,000 user groups. You need to create and maintain the user groups and accounts on the ReadyDATA. A ReadyDATA in an Active Directory environment can serve up to 65,535 users. Accounts for these users are created and maintained in the Active Directory, and are pulled into the ReadyDATA.

Configure the Global Security Access Mode

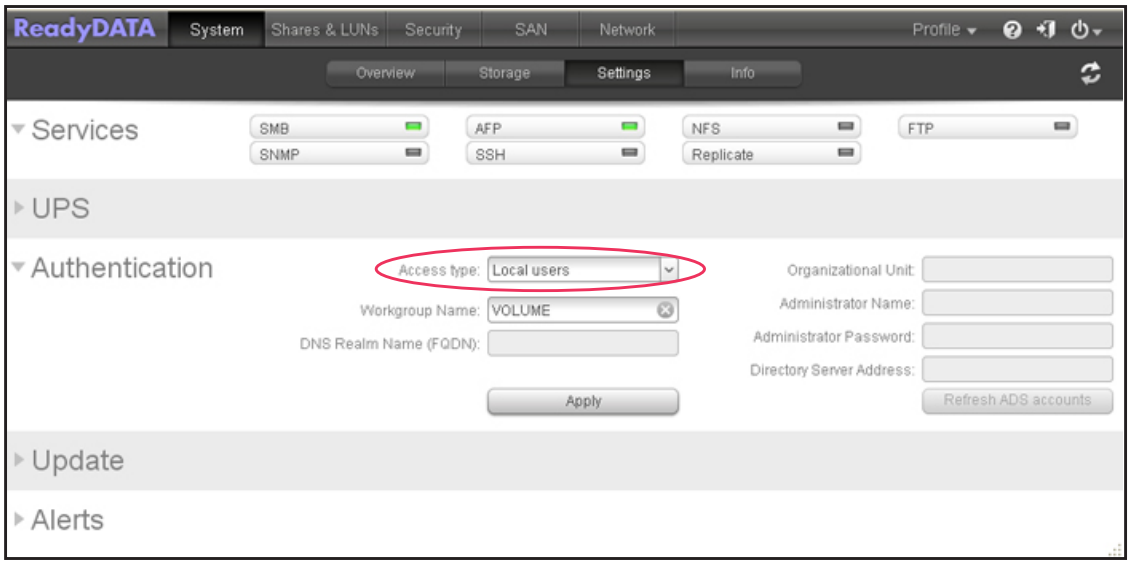
The ReadyDATA lets you use its local user database or an Active Directory for authentication of user and group access to shares. You configure either one or the other:

- **Local user database**.
  The local user database lets you create user groups and accounts on the ReadyDATA. You set access rights to shares at the share level (see *Set Up Access Rights to Shares* on page 80). NETGEAR recommends that you first create user groups, and then create user accounts, so you can assign users to groups.
- **Active Directory**.
  If your network includes a centralized Windows-based Active Directory server, this option is available to you. The ReadyDATA forms a trusted relationship with the Active Directory server and allows all user authentications to occur there. Users and groups are displayed in the Access section of the Properties pane on the Shares screen. You set access rights to shares at the share level (see *Set Up Access Rights to Shares* on page 80).

➢ **To configure the local user database settings:**

1. Select **System > Settings > Security**.
2. From the Access type drop-down list, select **Local users**.

   Except for the Workgroup Name field, all fields are dimmed. The following figure shows only the upper part of the Settings screen with the local database settings:



3. (Optional) Enter a name for the workgroup.

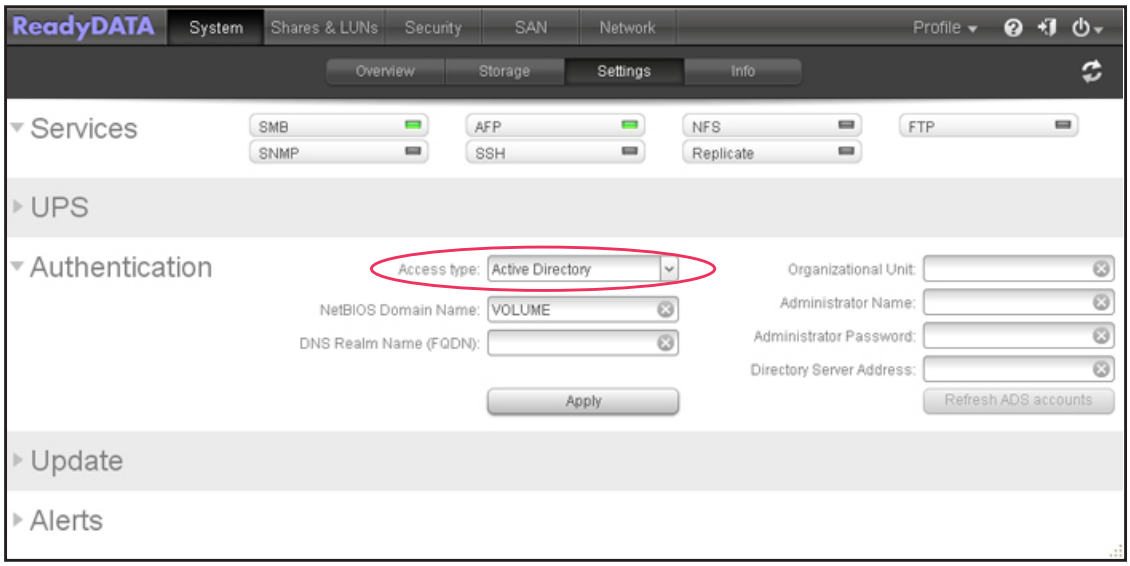
   You can keep the default name of VOLUME.

4. Click **Apply**.

➢ **To configure the Active Directory settings:**

1. Select **System > Settings > Security**.
2. From the Access type drop-down list, select **Active Directory**.

   The name of the Workgroup Name field changes to NetBIOS Domain Name, and all fields become available. The following figure shows only the upper part of the Settings screen with the Active Directory settings:



3. Configure the settings as explained in the following table:

Item	Description
NetBIOS Domain Name	Enter the name of the NetBIOS domain, for example, company. Normally, the NetBIOS domain name is identical to the prefix of the DNS realm name. **Note:** If the NetBIOS domain name does not properly represent the organizational structure or does not match the prefix naming rules, the name will differ from the prefix of the DNS realm name.
DNS Realm Name	Enter the DNS realm name, which is normally the DNS domain name or the Active Directory domain name, for example, company.community.com. In this example, *company* is the prefix, and *community* is the suffix of the name.
Include trusted domains	Select this check box to enable the ReadyDATA to automatically include the users of domains that have a trust relationship with the primary domain. **Note:** If the total number of users does not exceed 65,535, including trusted domains should not affect the responsiveness of the Dashboard.
Organizational Unit	Specify the location of the computer account of the ReadyDATA in the Active Directory. By default, the computer account for the ReadyDATA is placed in the \users organizational unit (OU), but you can use the Organizational Unit field to specify another OU. **Note:** The name of the computer account (also referred to as machine account) is the same as the host name of the ReadyDATA (see *Configure the Host Name* on page 48).
Administrator Name	Enter the name of the administrator of the Active Directory.
Administrator Password	Enter the password of the administrator of the Active Directory.
Server address	Enter the IP address of the Active Directory server.

4. Click **Apply**.

   To refresh the user accounts from the Active Directory server, click **Refresh ADS accounts**.

Manage User Groups for the Local Database

- *Create a User Group*
- *Delete a User Group*
- *Edit a User Group*

Management of user groups applies to the local user database only. If you select an Active Directory, groups are pulled into the ReadyDATA from the Active Directory server.

Create a User Group

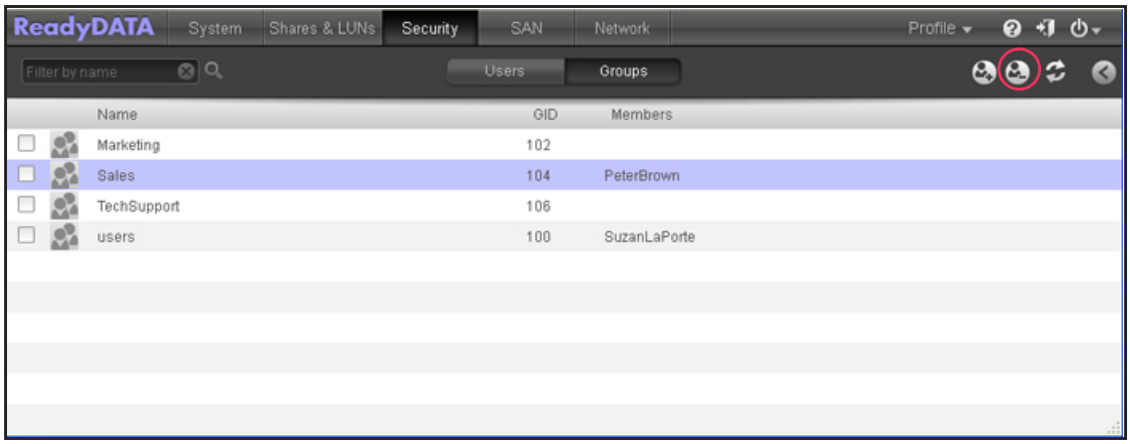
➢ **To create a user group:**

1. Select **Security**.

   The Security screen displays (see the figure in *Step 2*).

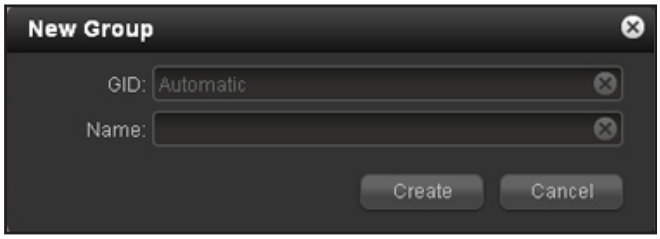
2. Click the **Groups** button.

   The following figure shows some examples. If you have not yet created any groups, only the default group with the name *users* and group ID (GID) *100* displays.



3. At the top right of the screen, click the **New Group** button ().

   The New Group pop-up screen displays:



4. Configure the following settings:
   - **GID**. Either leave the assignment of the group ID (GID) as Automatic, or enter a custom GID. If you leave automatic assignment, GIDs are assigned in increments of 2, starting with 102. That is, GIDs are assigned as 102, 104, 106, and so on.
   - **Name**. Enter a name to identify the group.
5. Click **Create**.

   The group is added to the table on the Security screen.

Note: On the Security screen, groups are sorted by group name. You cannot change the sort order.

Delete a User Group

When you delete a user group that is the primary group for a user, the user is no longer assigned to any group. You need to Edit the user account and assign the user to another primary group.

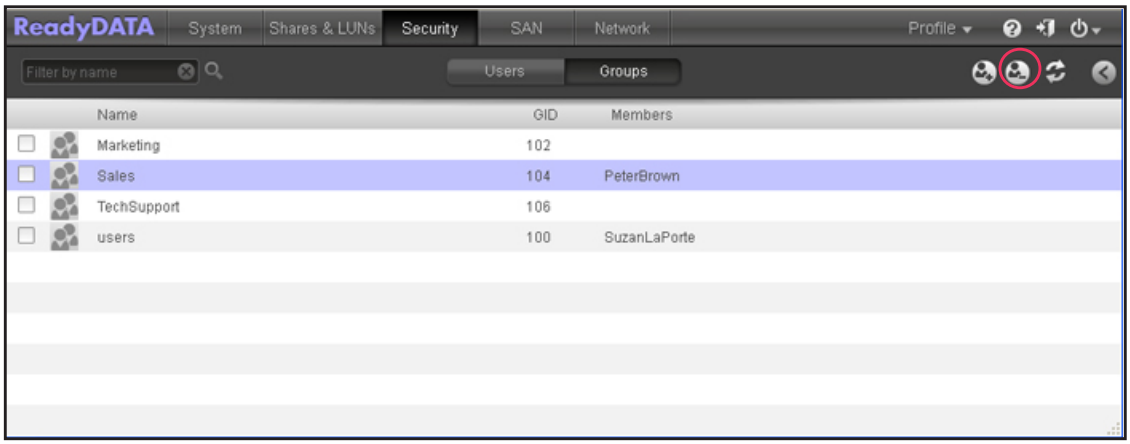
➢ **To delete a user group:**

1. Select **Security**.

   The Security screen displays (see the figure in *Step 2*).

2. Click the **Groups** button.

   The groups display:



3. Highlight the row of the group that you want to delete, or select the group's check box.

   If your system has many groups, you can use the search field on the left above the table.

4. At the top right of the screen, click the **Remove Group** button ( ).
5. Confirm the deletion.

Edit a User Group

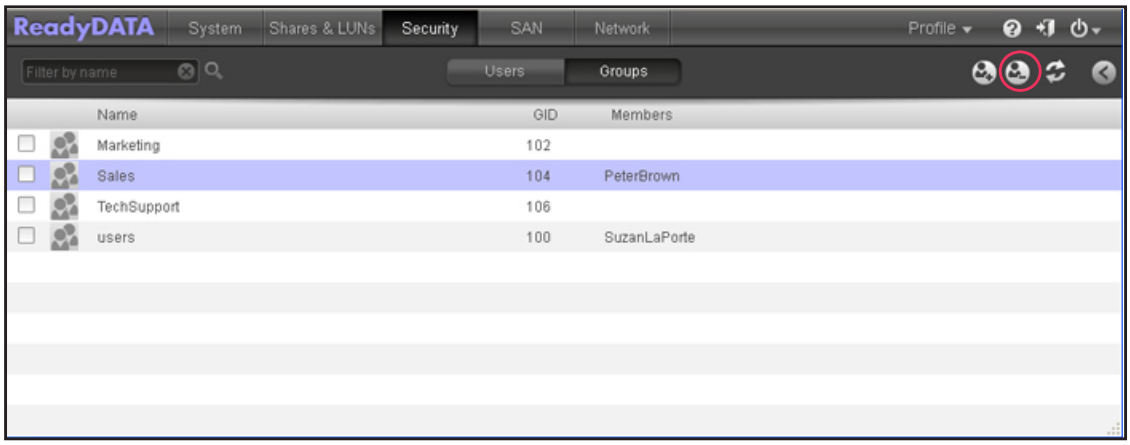
➢ **To edit a user group:**

1. Select **Security**.

   The Security screen displays (see the figure in *Step 2*).

2. Click the **Groups** button.

The groups display:

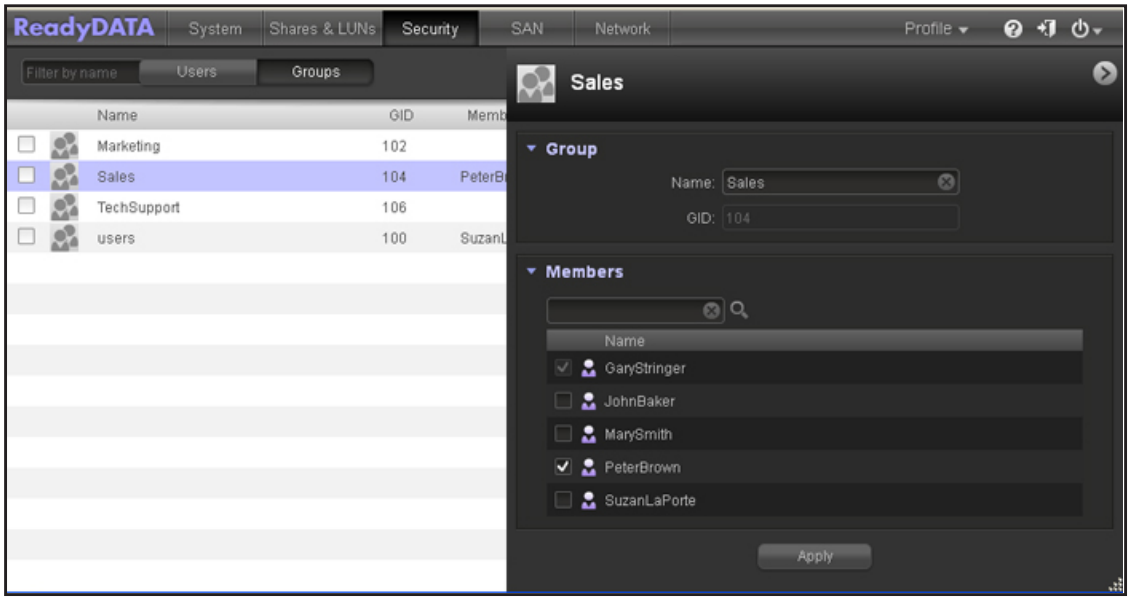


3. Highlight the row of the group that you want to edit, or select the group's check box.

   If your system has many groups, you can use the search field on the left above the table.

4. At the top right of the screen, click the screen **Expand** button ( ).

   The Group Details pane displays. (The following figure contains examples of groups and users.)



5. Make the changes as required, using the following guidelines:
   - You can change the name that identifies the group in the Name field.
   - You cannot change the GID.
   - You can add one or more members to the group by selecting the check box that is associated with each member. The check boxes for members for which the group is

the primary group are dimmed (for more information, see *Create a User Account* on page 129).

6. Click **Apply**.
7. Click the screen **Expand** button (which now appears as a reversed arrow ) again.

   The Group Details pane is hidden.

Note: The members column in the previous screen shows only the users that you manually added to the group as explained in *Step 5* of the previous procedure. Members for which the group is the primary group are not shown in the members column.

Manage User Accounts for the Local Database

- *Create a User Account*
- *Delete a User Account*
- *Edit a User Account*

Except for administrative accounts, management of user accounts applies to the local user database only. If you select an Active Directory, user accounts are pulled into the ReadyDATA from the Active Directory server.

Tip: NETGEAR recommends that you first create groups, then set new user account preferences, and then create user accounts, so you can assign users to groups.

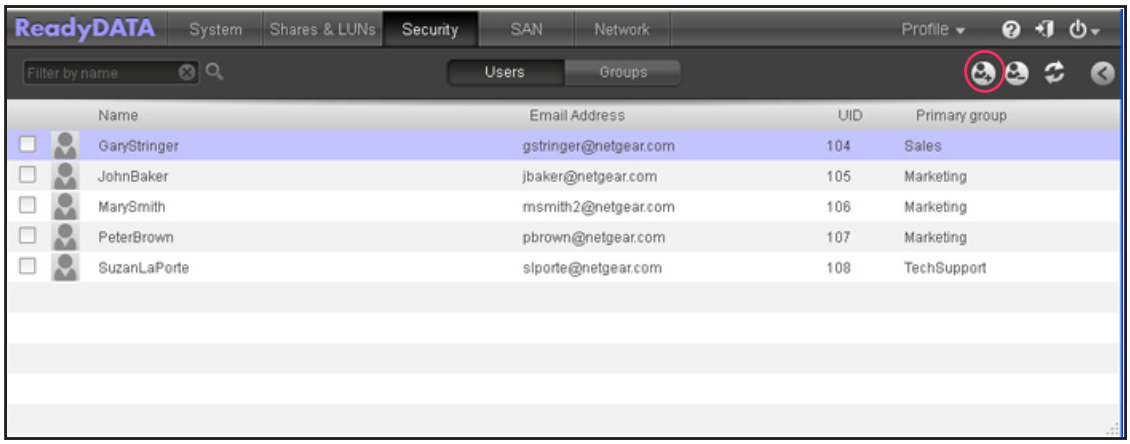
Create a User Account

You can create up to 65,535 user accounts on the ReadyDATA.

➢ **To create a user account:**

1. Select **Security**.

   Make sure that the Users button is highlighted (it should be by default; if it is not, click the **Users** button). The Security screen displays. If you have not yet created any users accounts, none are shown, that is, no default user accounts exist.



2. Click the **New User** button ( ).

   The New User pop-up screen displays:

3. Configure the settings as explained in the following table.

   With exception of the Email Address field, all field are required.

Item	Description
Name	Enter a name to identify the user. User names can have a maximum of 31 characters in most non-Asian languages. If you use Asian language characters, the limit is lower. You can use most alphanumeric and punctuation characters for a user name.
UID	Either leave the assignment of the user ID (UID) as Automatic, or enter a custom UID. If you leave automatic assignment, UIDs are assigned in increments of 1, starting with 100. That is, UIDs are assigned as 100, 101, 102, and so on.

Item	Description
Primary Group	From the drop-down list, select the primary group to which the user is assigned. The default group is called *users*. For information about creating groups, see *Create a User Group* on page 126. **Note:** In addition to belonging to a single primary group, a user can belong to many other groups. You can assign additional groups on the group detail pane (see *Edit a User Group* on page 127).
Email Address	As an option, enter the email address of the user.
Password	Enter a password. Each user password can have a maximum of 255 characters.
Re-enter Password	Reenter the user password.

4. Click **Create**.

   The user is added to the table on the Security screen.

Note: On the Security screen, users are sorted by user name. You cannot change the sort order.

Delete a User Account

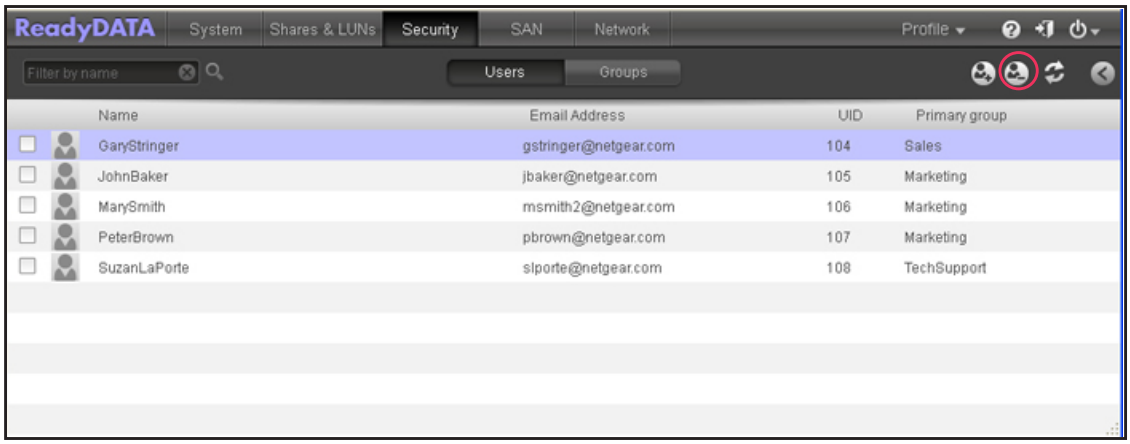
WARNING:

Files on the ReadyDATA that are owned by a user for which you delete the user account might become inaccessible. When you delete a user account, the ReadyDATA deletes the associated home share and its contents.

➢ **To delete a user account:**

1. Select **Security**.

   The Security screen displays. Make sure that the Users button is highlighted (it should be by default; if it is not, click the **Users** button).



2. Highlight the row of the user account that you want to delete, or select the user account's check box.

   If your system has many user accounts, you can use the search field on the left above the table.

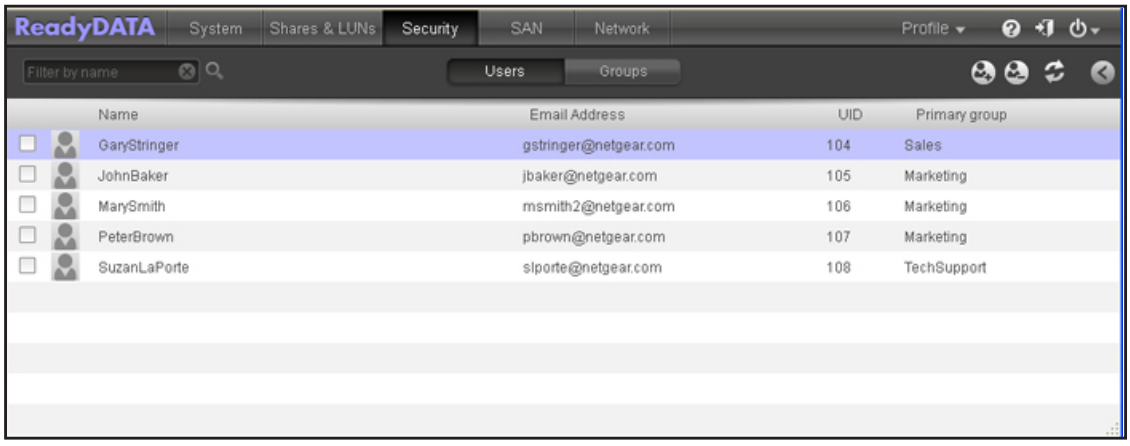
3. At the top right of the screen, click the **Remove User Account** button ( ).
4. Confirm the deletion.

Edit a User Account

➢ **To edit a user account:**

1. Select **Security**.

   The Security screen displays. Make sure that the Users button is highlighted (it should be by default; if it is not, click the **Users** button).

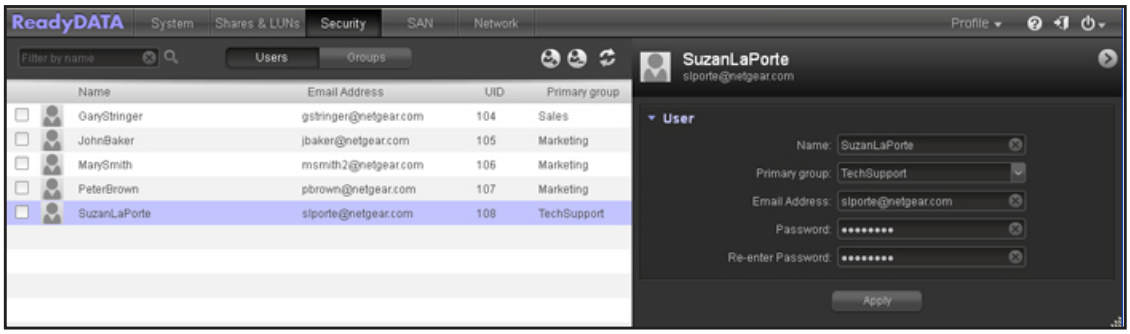


2. Highlight the row of the user account that you want to edit, or select the user account's check box.

If your system has many user accounts, you can use the search field on the left above the table.

3. At the top right of the screen, click the screen **Expand** button ( ).

   The User Account Details pane displays. (The following figure contains an example.)



4. In the User Account Details pane, change the settings as explained in the following table:

Item	Description
Name	Enter a name to identify the user. User names can have a maximum of 31 characters in most non-Asian languages. If you use Asian language characters, the limit is lower. You can use most alphanumeric and punctuation characters for a user name.
Primary Group	From the drop-down list, select the primary group to which the user is assigned. For information about creating groups, see *Create a User Group* on page 126. **Note:** In addition to belonging to a single primary group, a user can belong to many other groups. You can assign additional groups on the group detail pane (see *Edit a User Group* on page 127).
Email Address	As an option, enter the email address of the user.
Password	Enter a password. Each user password can have a maximum of 255 characters.
Re-enter Password	Reenter the user password.

Note: *You cannot change the UID.*

5. Click **Apply**.
6. Click the screen **Expand** button (which now appears as a reversed arrow) again.

   The User Account Details pane is hidden.

6 System Maintenance and Monitoring

This chapter describes how to manage your ReadyDATA storage system's configuration, network settings, add-ons, and USB storage devices. It contains the following sections:

- *System Maintenance*
- *System Monitoring*
- *Optional Uninterruptible Power Supplies*

Note: Without at least one volume, changes are not saved after you reload the ReadyDATA. Make sure that you create a volume before you update the firmware or configure system logs, SNMP monitoring, and optional uninterruptible power supplies. For information about how to configure volumes, see *Chapter 2, Manage Disks and Volumes*.

Note: For information about how to set up system alerts, see *Configure System Alerts* on page 46.

System Maintenance

Update the Firmware

NETGEAR might periodically release firmware updates to improve the ReadyDATA. The firmware on the ReadyDATA is referred to as ReadyDATA OS. You can update the firmware on the ReadyDATA remotely from the NETGEAR website or manually from a local drive.

When you update the firmware, the stored data on the ReadyDATA is not affected. However, as a security measure, NETGEAR recommends that you back up the stored data, especially data that cannot be replaced, before you perform a firmware update.

WARNING:

You cannot update the firmware if there are no volumes on the ReadyDATA. To update the firmware, create at least one volume.

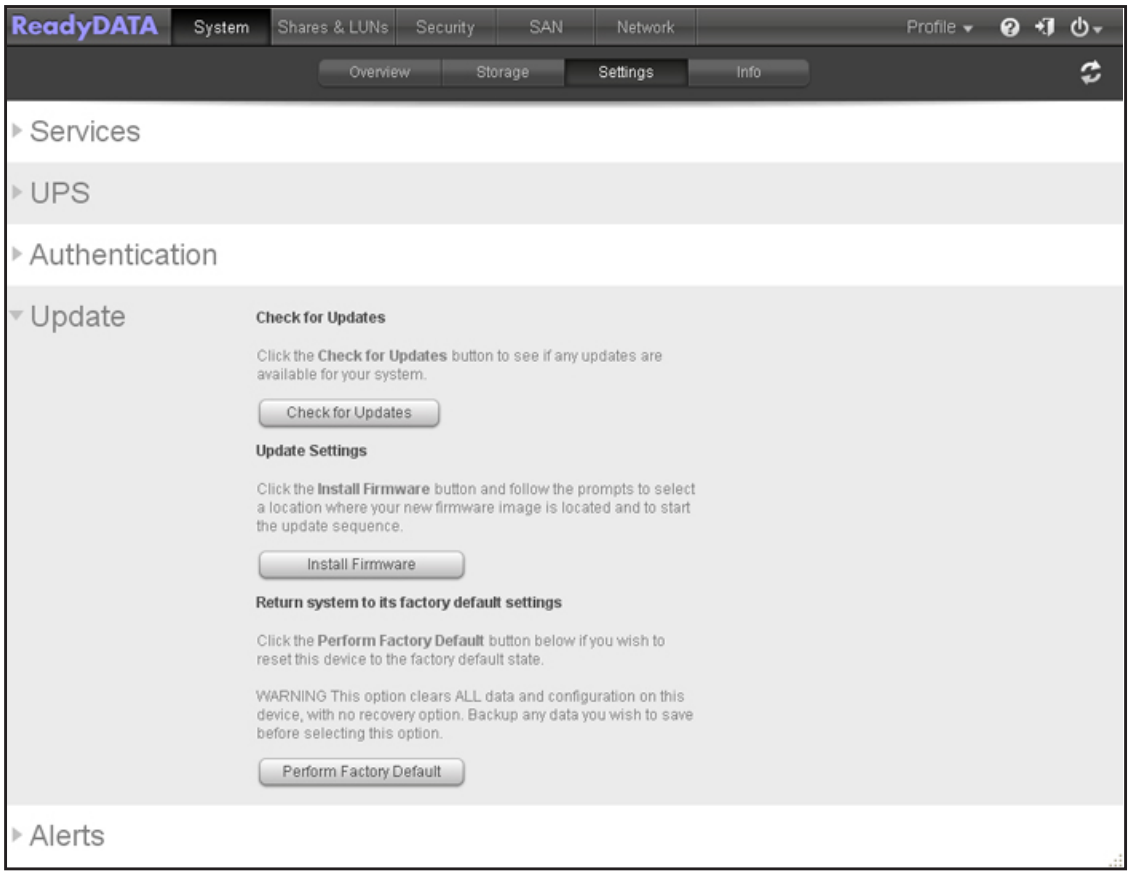
Update Firmware Remotely

If the ReadyDATA has an Internet connection, updating firmware remotely is the easiest method.

➢ **To update firmware remotely:**

1. Select **System > Settings > Update**.

   The following figure shows the Settings screen with the firmware options:



2. Click **Check for Updates**.

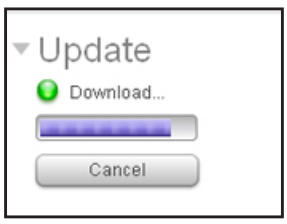
   The ReadyDATA contacts the NETGEAR update server:

   If no firmware update is available, you are notified that the system is running the most current firmware.

   If a firmware update is available, you are prompted to update the system firmware.

3. If a firmware update is available, click **Install Firmware**.

   A status bar on the left of the screen shows the progress of the firmware download. After the firmware download completes, you are prompted to reboot the system.



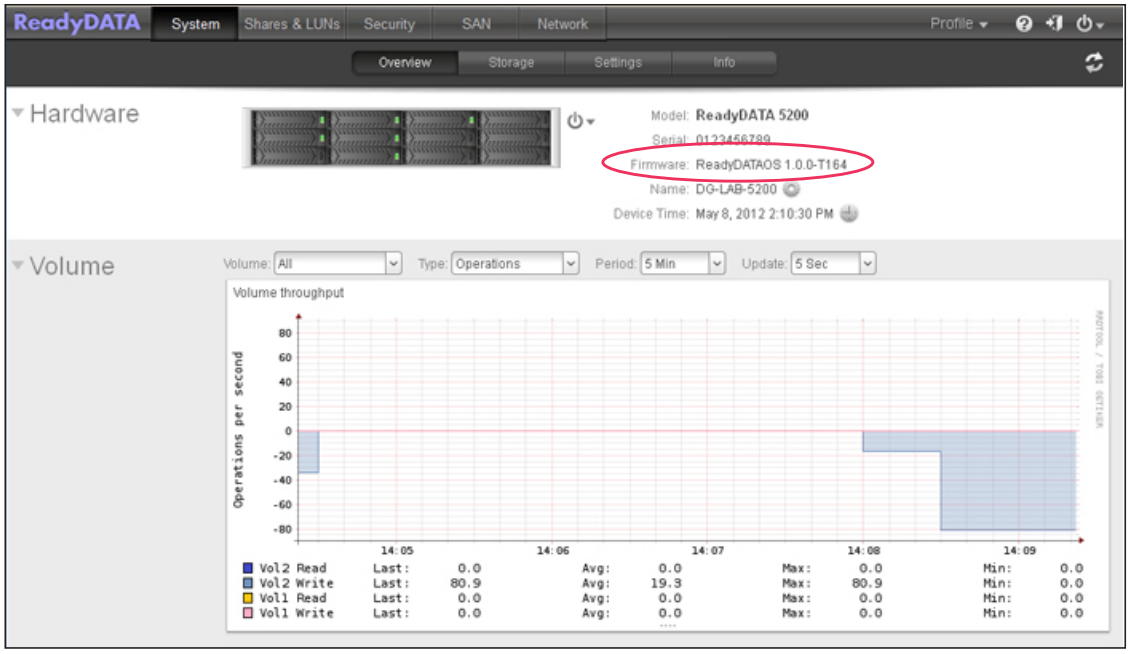
4. Click **Reboot** under the Update heading.

If you enabled email alerts, the ReadyDATA sends a message when the firmware update finishes.

5. (Optional) Verify that the ReadyDATA runs the new firmware.

   Select **System > Overview > Hardware**. The Dashboard home screen displays.

   Check which firmware version is listed in the Firmware field.



Update Firmware Locally

If the ReadyDATA is installed at a location that does not have Internet access, you need to update your firmware locally.

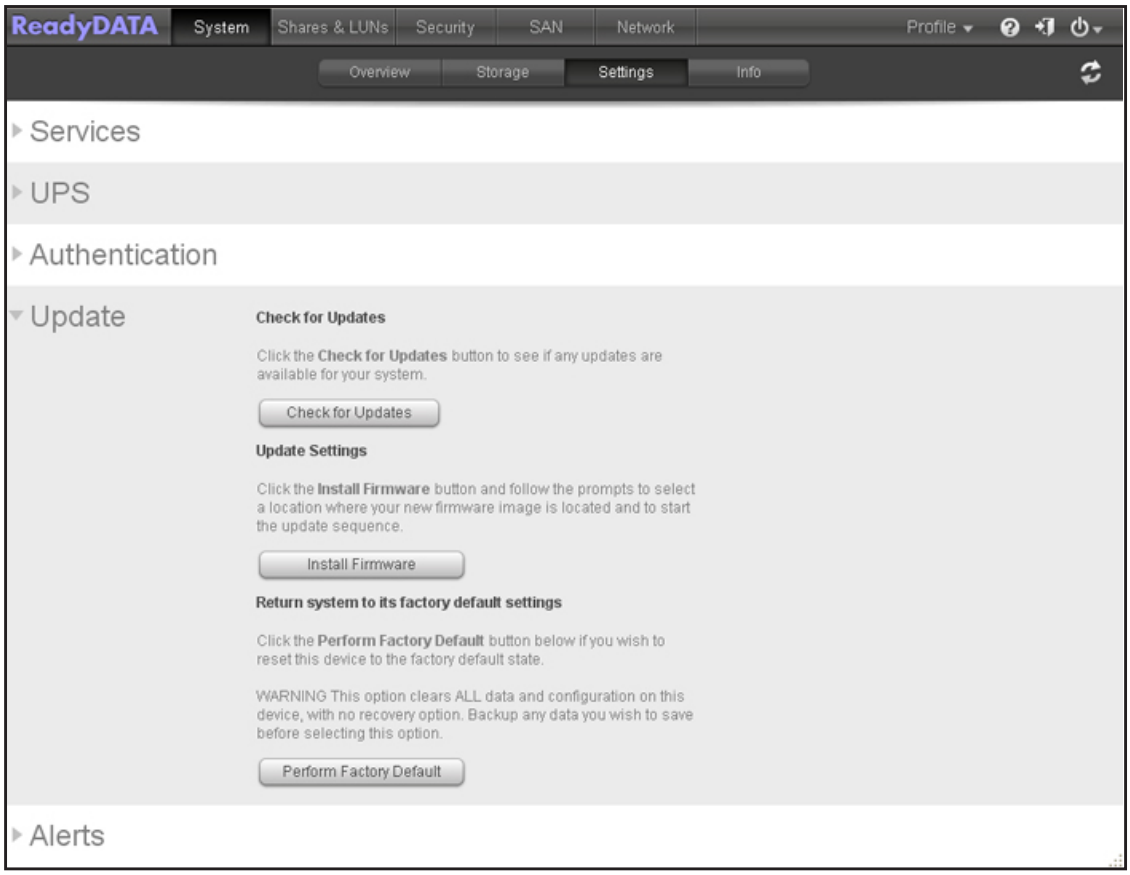
➢ **To update firmware locally:**

1. Using a computer that has Internet access, download the latest firmware for the ReadyDATA from *http://readynas.com/downloads* to a USB drive or connected computer.
2. Connect the USB drive with the updated firmware file to your ReadyDATA.

   For more information about the USB ports on the ReadyDATA, see the *ReadyDATA Hardware Manual*.

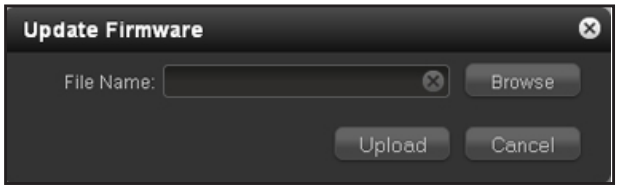
3. Select **System > Settings > Update**.

   The following figure shows the Settings screen with the firmware options:



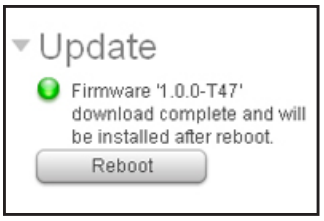
4. Click **Install Firmware**.

   The Update Firmware pop-up screen displays:



5. Click **Browse**, navigate to the file containing the updated firmware, and select it.
6. Click **Upload**.

   A status progress circle shows the progress of the firmware upload. After the firmware upload is complete, you are prompted to reboot the system.



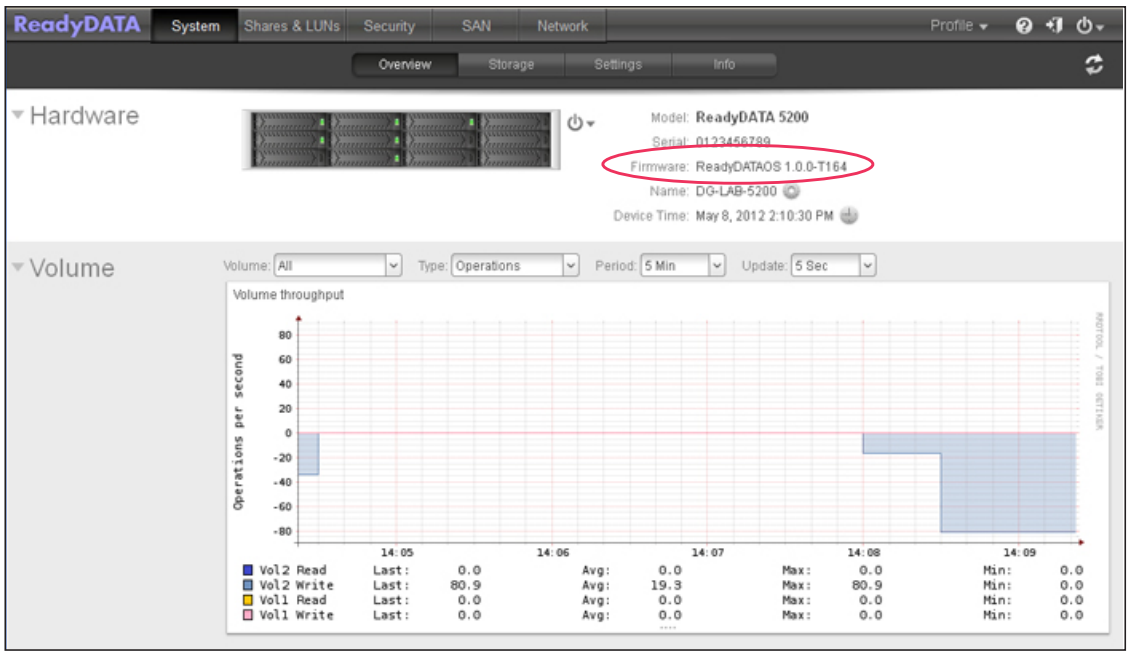
7. Click **Reboot** under the Update heading.

   If you enabled email alerts, the ReadyDATA sends a message when the firmware update finishes.

8. (Optional) Verify that the ReadyDATA runs the new firmware.

   Select **System > Overview > Hardware**. The Dashboard home screen displays.

   Check which firmware version is listed in the Firmware field.



Reset the Firmware to Factory Defaults

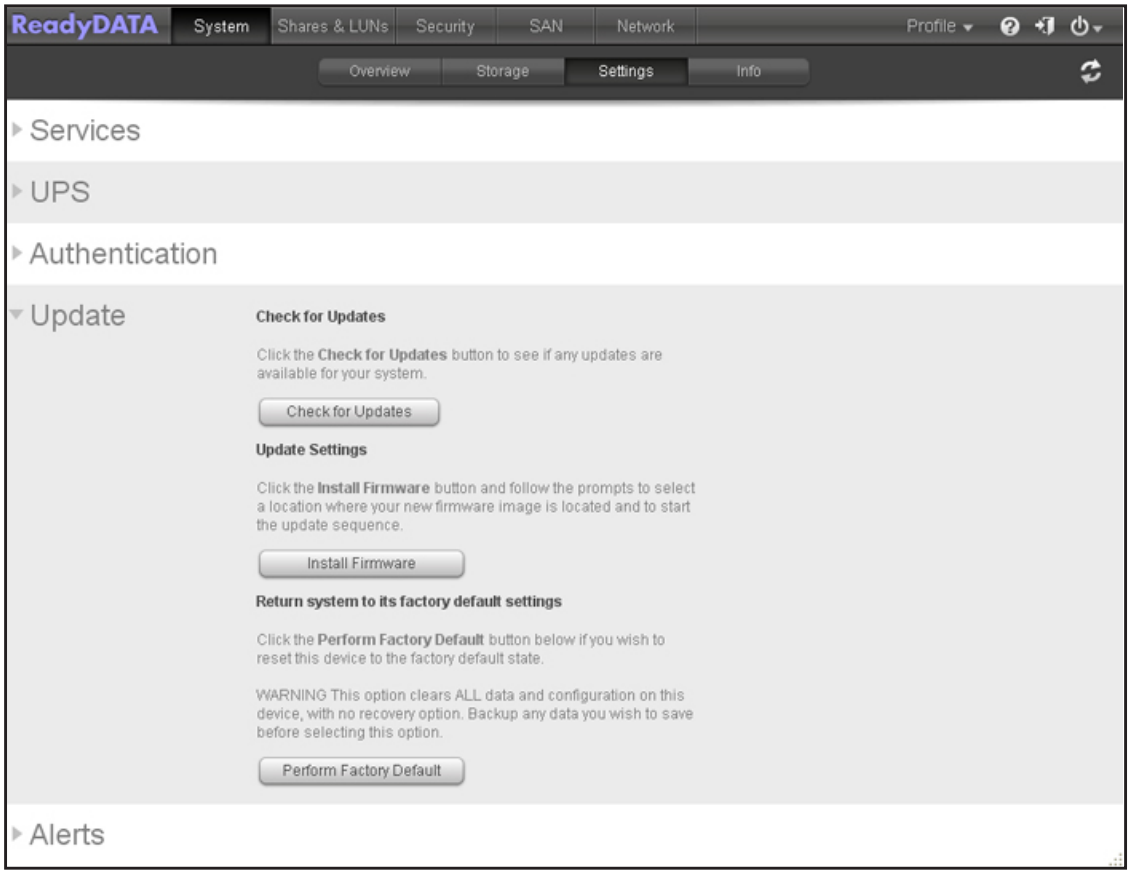
WARNING:

Resetting the ReadyDATA to factory defaults deletes not only the configuration but also all stored data. Back up the stored data if you intend to use it again.

➢ **To reset the ReadyDATA to factory defaults:**

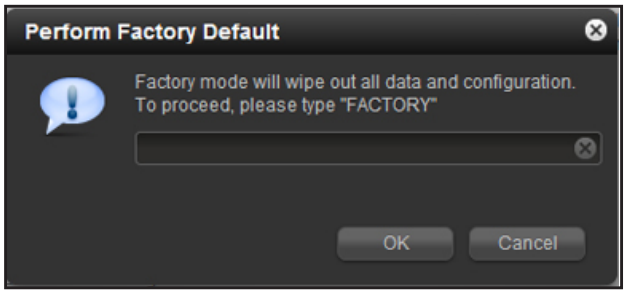
1. Select **System > Settings > Update**.

   The following figure shows the Settings screen with the firmware options:



2. Click **Perform Factory Default**.

   The Perform Factory Default pop-up screen displays:



3. Type **FACTORY** (all capital letters) in the field.
4. Click **OK**.

If you enabled email alerts, the ReadyDATA sends a message when the factory defaults are restored.

Shut Down or Restart the System

Use the Power icon that is accessible from any Dashboard screen to gracefully shut down or restart the ReadyDATA.

➢ **To gracefully shut down or restart the system:**

1. Click the **Power** icon in the upper right corner of the navigation bar:

2. Select one of the following options from the drop-down list:
   - **Shut down**. Gracefully power down the system.
   - **Restart**. Gracefully power down the system and restart it.
3. Confirm your selection.

   If you enabled email alerts, the ReadyDATA sends a message after it restarts.

Recover the Administrator Password

You can recover a lost or forgotten administrator password in two ways:

- **Use NETGEAR's password recovery tool**. This web-based tool requires that you enable administrator password recovery on your ReadyDATA *before* you can use it. For more information, see *Set the Administrator Password* on page 45.
- **Perform an OS reinstall reboot**. This process reinstalls the firmware on the ReadyDATA and resets the administrator user name and password to factory defaults.

Recover the Administrator Password Using NETGEAR's Password Recovery Tool

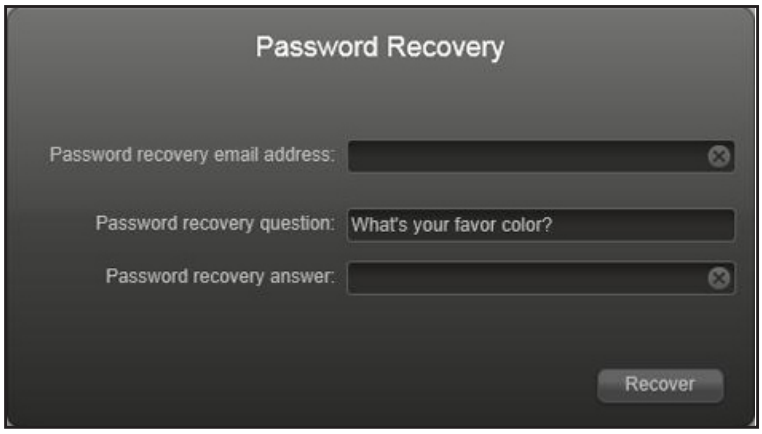
This procedure is an option *only* if you enabled password recovery by providing a password recovery question, answer, and email address as described in *Set the Administrator Password* on page 45. If you lost the password but did not enable administrator password recovery, see *Recover the Administrator Password Using an OS Reinstall Reboot* on page 142.

➢ **To recover your administrator password using NETGEAR's password recovery tool:**

1. Go to https://<*ReadyDATA_IP_address*>/password_recovery.

   <*ReadyDATA_IP_address*> is the IP address of the ReadyDATA.

   The ReadyDATA Password Recovery screen displays:



2. Enter the email address and password recovery answer that you enabled on the ReadyDATA.

   See *Set the Administrator Password* on page 45.

3. Click **Recover**.

   NETGEAR resets the administrator password and sends an email message with the new password to the password recovery email address.

Recover the Administrator Password Using an OS Reinstall Reboot

This process does not remove data from the system, but resets the administrator user name and password to the factory defaults, which are *admin* and *password*.

For information about how to perform an OS reinstall reboot on the ReadyDATA, see the *ReadyDATA Hardware Manual*.

System Monitoring

- *System Real-Time and Historical Monitoring*
- *System Health Information*
- *Disk Status and Health Information*
- *System Logs*
- *SNMP Monitoring*
- *Add and Monitor UPS Devices*

System Real-Time and Historical Monitoring

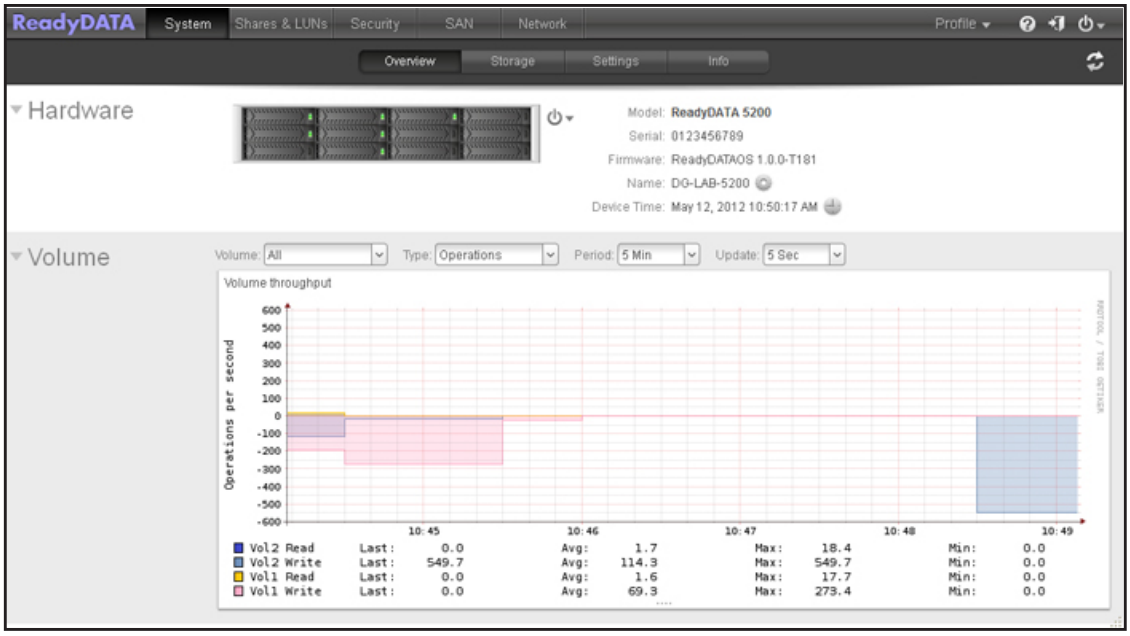
The ReadyDATA provides status graphics for volume throughput, network throughput, volume utilization, and system temperatures.

➢ **To display and configure the system status graphics:**

Select **System > Overview**.

The Dashboard home screen displays. The following status monitoring graphics are located below the Hardware section (if a graphic does not display, click the associated heading on the left of the screen):

- **Volume**.



The Volume throughput graphic shows either the number of read and write operations per second or the bandwidth consumed per second:

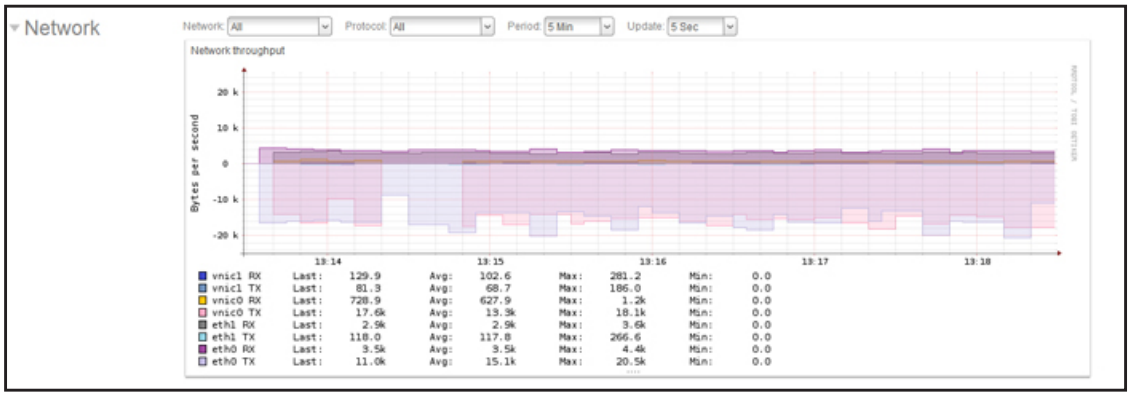
- **Operations**. The range is flexible and depends on your selections from the drop-down lists above the graphic. For example, the range can be from 0 to 200 operations. The upper part of the graphic indicates the number of read operations (indicated by positive numbers); the lower part of the graphic indicates the number of write operations (indicated by negative numbers).
- **Bandwidth**. The range is flexible and depends on your selections from the drop-down lists above the graphic. For example, the range can be from 0 to 4 Mbps. The upper part of the graphic indicates the bandwidth consumed for read operations (indicated by positive numbers); the lower part of the graphic indicates the bandwidth consumed for write operations (indicated by negative numbers).

From the drop-down lists above the graphic, you can adjust the following settings:

- **Volume**. Select all volumes or individual volumes.
- **Operations**. Select the number of operations per second or the bandwidth consumed per second.
- **Period**. Select the period over which the operations or bandwidth is measured. You can select from five minutes to one year.

- **Update**. Select how often the information in the graphic is updated. You can select from 5 to 50 seconds.

- **Network**.

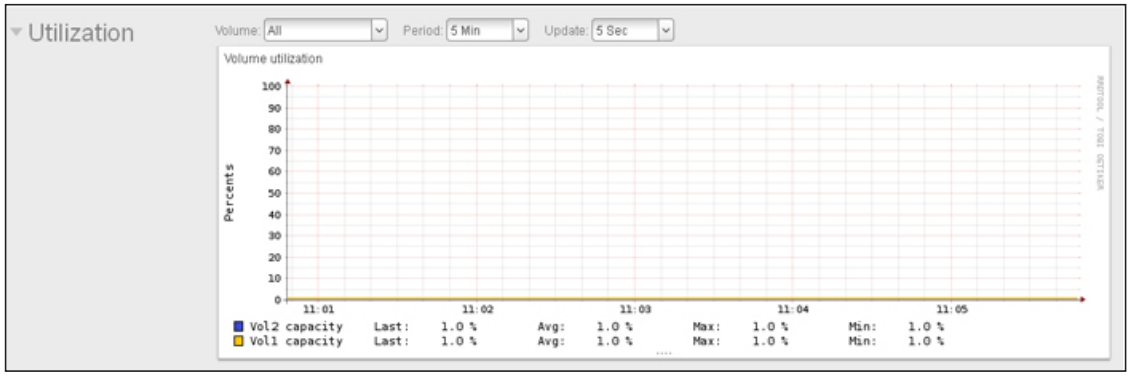


The Network throughput table shows the network usage for Tx and Rx traffic in bytes per second. The range is flexible and depends on your selections from the drop-down lists above the graphic. For example, the range can be 0 to 60 bytes or from 0 to 40 KB. The upper part of the graphic indicates the Rx traffic; the lower part of the graphic indicates the Tx traffic.

From the drop-down lists above the graphic, you can adjust the following settings:

- **Network**. Select all network interfaces, individual interfaces, individual VNICs, or individual aggregation links.
- **Protocol**. Select all protocols or individual protocols (SMB, NFS, AFP, HTTP, SSH, iSCSI, or SNMP).
- **Period**. Select the period over which the network usage is measured. You can select from five minutes to one year.
- **Update**. Select how often the information in the table is updated. You can select from 5 to 50 seconds.

- **Utilization**.

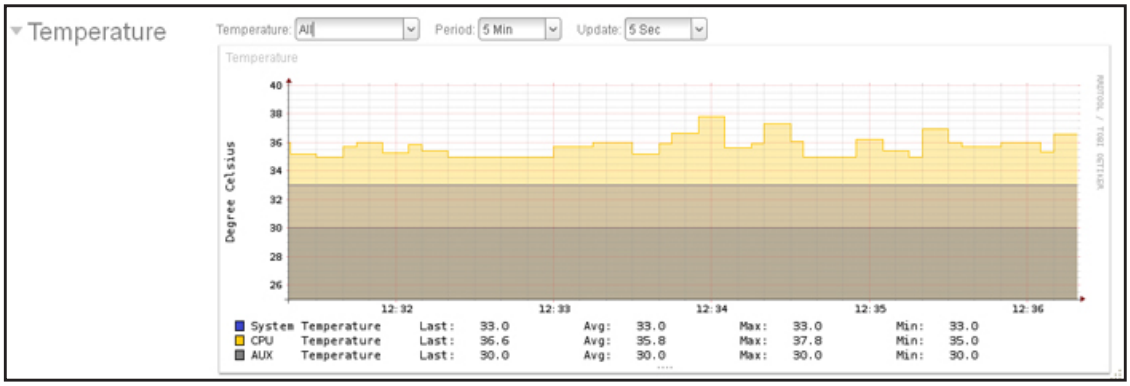


The Volume utilization graphic shows the percentage that an individual volume or all volumes are used. The range is from 0 to 100 percent.

From the drop-down lists above the graphic, you can adjust the following settings:

- **Volume**. Select all volumes or individual volumes.
- **Period**. Select the period over which the utilization is measured. You can select from five minutes to one year.
- **Update**. Select how often the information in the table is updated. You can select from 5 to 50 seconds.

- **Temperature**.



The Temperature graphic shows the system temperatures in degrees Celsius. The range is flexible and depends on your selections from the drop-down lists above the graphic and the temperatures that are measured. For example, the range can be from 0 to 50 degrees Celsius.

From the drop-down lists above the graphic, you can adjust the following settings:

- **Temperature**. Select all temperatures, the system (SYS) temperature, the CPU temperature, or the auxiliary (AUX) temperature.
- **Period**. Select the period over which the temperatures are measured. You can select from five minutes to one year.
- **Update**. Select how often the information in the table is updated. You can select from 5 to 50 seconds.

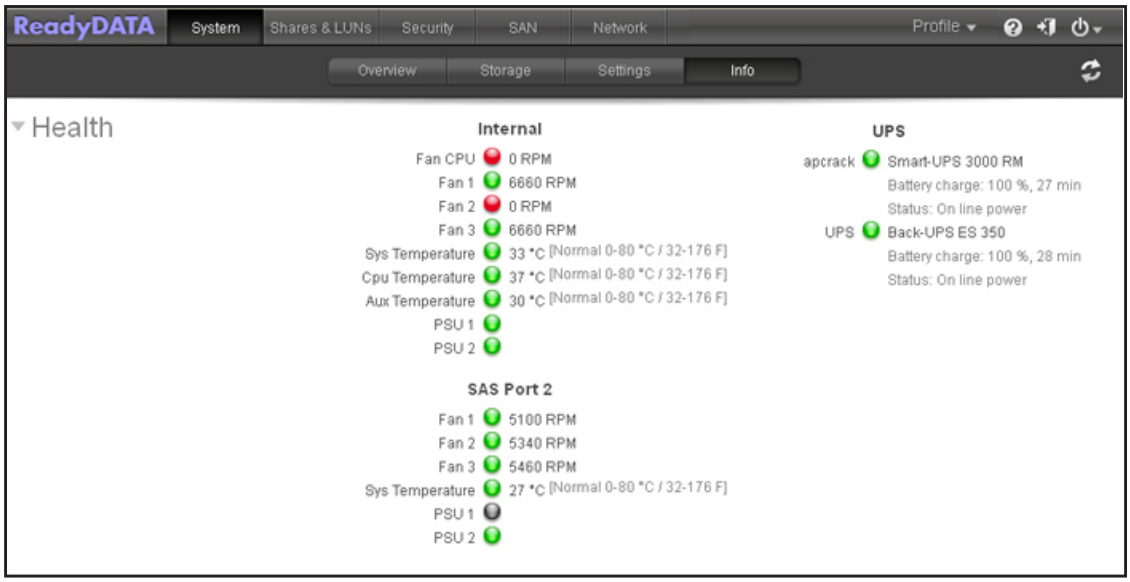
System Health Information

The ReadyDATA provides basic system health information about the fans, temperatures, power supplies, and optional UPS on the internal enclosure and optional expansion disk arrays.

➢ **To view system health information:**

Select **System > Info > Health**.

The following figure shows only the Health section on the Info screen. The messages are self-explanatory.



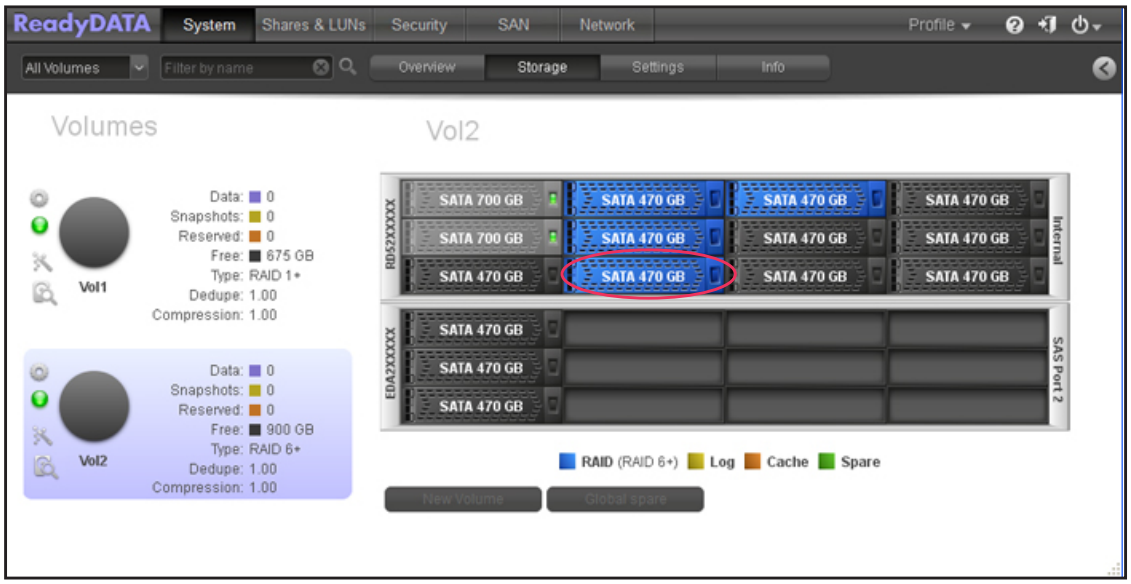
Disk Status and Health Information

The ReadyDATA provides disk status and health information for each disk that is installed in its enclosure and expansion units.

➢ **To view disk status and health information for an individual disk:**

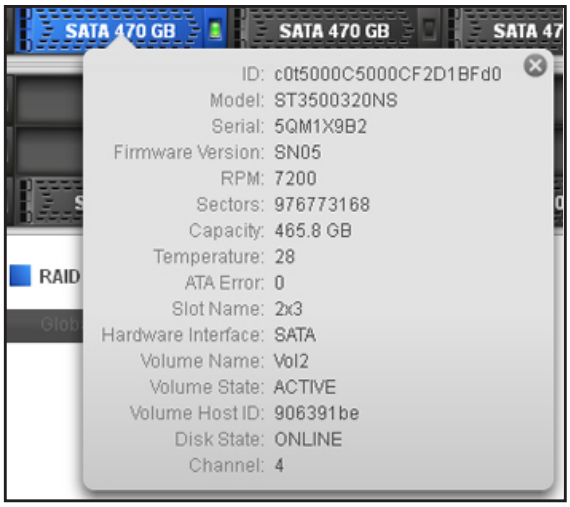
1. Select **System > Storage**.

   The Storage screen displays:



2. Hover your cursor over a disk in the graphical enclosure.

   Disk status and health information displays in a pop-up screen:



Most fields are self-explanatory. The following fields, however, require some explanation:

- **Volume State**. NEW, ACTIVE, EXPORTED, or DESTROYED.
- **Disk State**. AVAIL (available), ONLINE, OFFLINE, UNKNOWN, or FAULTED.
- **Channel**. The slot in which the disk is installed. (On the ReadyDATA, slots are numbered in sequential and ascending order from the bottom to the top of the enclosure, starting with 1 at the bottom left and ending with 12 at the top right.)

Note: If a disk fails, it is shown with a cross icon in the graphical enclosure (see *Figure 3* on page 20, which does not include a failed disk).

System Logs

You can view system log messages onscreen, download the complete system logs to a local computer or USB drive, and receive system alerts. System logs provide information about the status of various system management tasks, including a time stamp. These logs are used primarily to troubleshoot problems. If you call NETGEAR technical support, the representative might ask you to send your system logs.

Depending on the settings, the system logs record events such as the following:

- System events such as the creation or deletion of a share, LUN, or snapshot, or quota violations, or low disk space
- Addition and removal of hot-swappable disks
- Detection of disk types and hardware statistics
- Removal and addition of SAS-attached expansion enclosures
- Removal and addition of SSDs
- Removal and addition of power supplies

- Removal and addition of a UPS
- Connection and disconnection of external USB devices

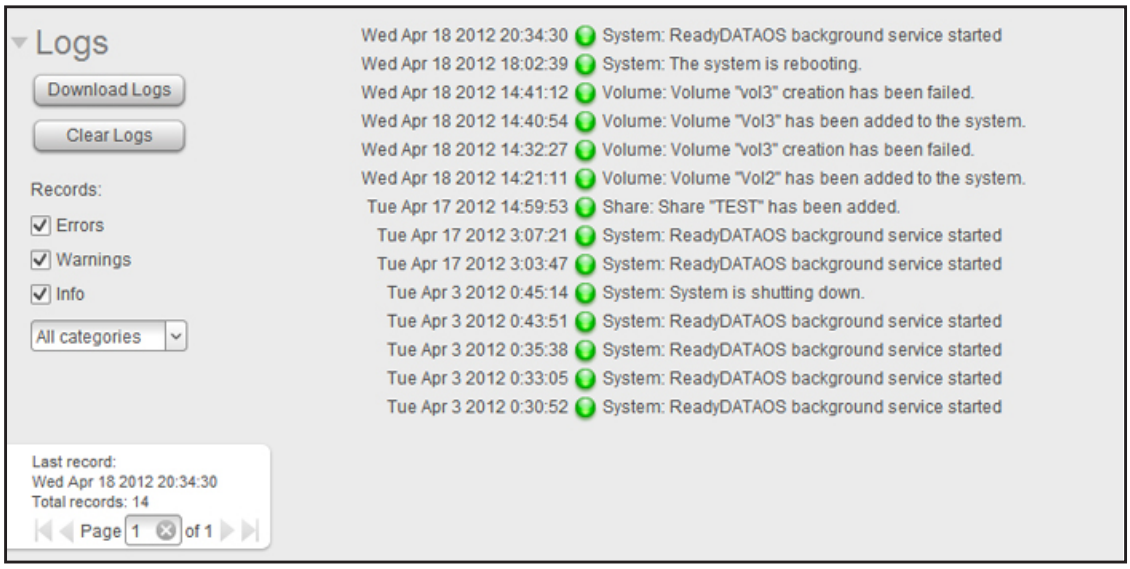
In addition to a record in the system logs, the following events also generate alerts (see *Configure System Alerts* on page 46) and SNMP traps (see *SNMP Monitoring* on page 149) and are displayed onscreen:

- Disk errors and failures
- Changes in network connectivity
- Power supply failures
- UPS failures
- Fan speed irregularities and fan failures
- CPU and enclosure temperature violations

➢ **To display and manage the system logs:**

Select **System > Info > Logs**.

The following figure shows only the Logs section on the Info screen:



You can download the logs, clear the logs onscreen, and configure the logs:

- **Download the logs**. Click the **Download Logs** button to download a zipped file with all log files to your browser's default download location. The default name of the zipped file is System_log_<*host name*>.zip, in which <*host name*> is the host name of the ReadyDATA (see *Configure the Host Name* on page 48).
- **Clear the logs**. Click the **Clear Logs** button. The log entries onscreen are cleared but the log files remain intact.
- **Configure the logs**. Under Records, select which message levels and categories are logged. These selections affect the system logs, alerts, SNMP traps, and onscreen messages.

- **Message levels**. By default, the Errors, Warnings, and Info check boxes are selected, causing errors, warnings, and informational messages to be logged. You can clear any check boxes.
- **Message categories**. By default, messages for all categories are logged. From the drop-down list, you can select to log individual categories only: System, Disk, Volume, Share, Account, or Miscellaneous.

Use the navigation box in the lower left of the screen to view additional messages onscreen.

SNMP Monitoring

Use SNMP management systems such as HP OpenView or CA UniCenter for remote monitoring of the ReadyDATA. (Management over SNMP is not supported.) See the previous section for information about the types of messages that the ReadyDATA can send to SNMP hosts.

For information about how to configure SNMP and SNMP hosts, see *Configure SNMP* on page 66.

You can import the NETGEAR SNMP MIB to your SNMP client applications. This MIB is on the *Installation CD* included with your unit. You can also download the MIB from *http://support.netgear.com*.

Optional Uninterruptible Power Supplies

About Uninterruptible Power Supplies

NETGEAR recommends that you connect the ReadyDATA physically to one or more uninterruptible power supply (UPS) devices to protect against data loss due to power failures. Once connected, you can add up to three UPS devices to Dashboard to enable the ReadyDATA to monitor and manage them. The ReadyDATA supports SNMP UPS devices and remote UPS devices.

If you enable email alerts, the ReadyDATA sends a message if a UPS status changes. For example, if a power failure forces a UPS into battery mode, or when a battery is low, you receive an email message.

When *any* UPS battery is low, or when a power failure occurs, the ReadyDATA automatically shuts down gracefully. In a configuration with an optional expansion disk array that is also connected to a UPS, before the ReadyDATA shuts down, it saves data to disks in the expansion disk array. However, the expansion disk array does not automatically shut down. If the batteries in the UPS to which the expansion disk array is connected become low, the

expansion disk array shuts down ungracefully, but data has already been saved and is therefore safe.

Both the ReadyDATA and expansion disk arrays have dual power supplies. For full power protection, all power supplies should be connected to UPS devices.

UPS Configurations

The ReadyDATA supports UPS devices managed over SNMP and UPS devices managed over a remote connection.

UPS Devices Managed over SNMP

An SNMP UPS lets the ReadyDATA query the manufacturer-specific MIB. The ReadyDATA monitors and manages the UPS through SNMP. The Ethernet connection between the UPS and the ReadyDATA passes through a switch.

The following figures show scenarios that include a UPS that is managed over SNMP. Although dual power supplies and dual UPS devices are not shown in all figures, for full power protection, each power supply should be connected to a UPS.

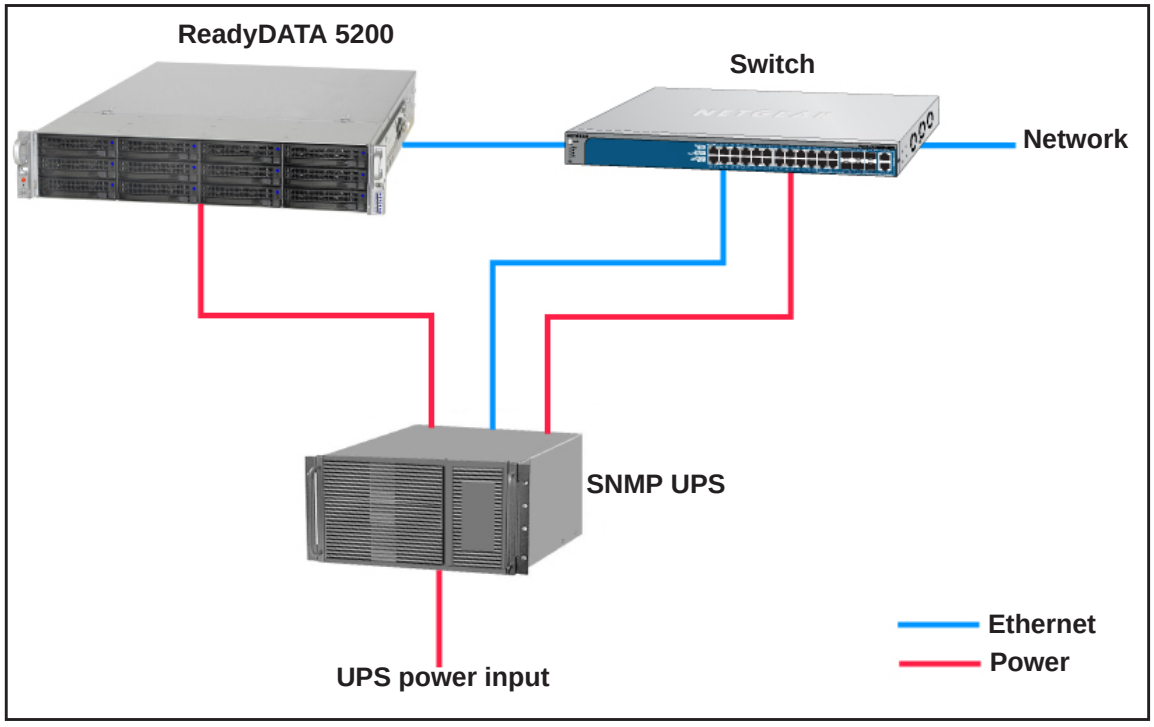


Figure 8. ReadyDATA with a UPS managed over SNMP

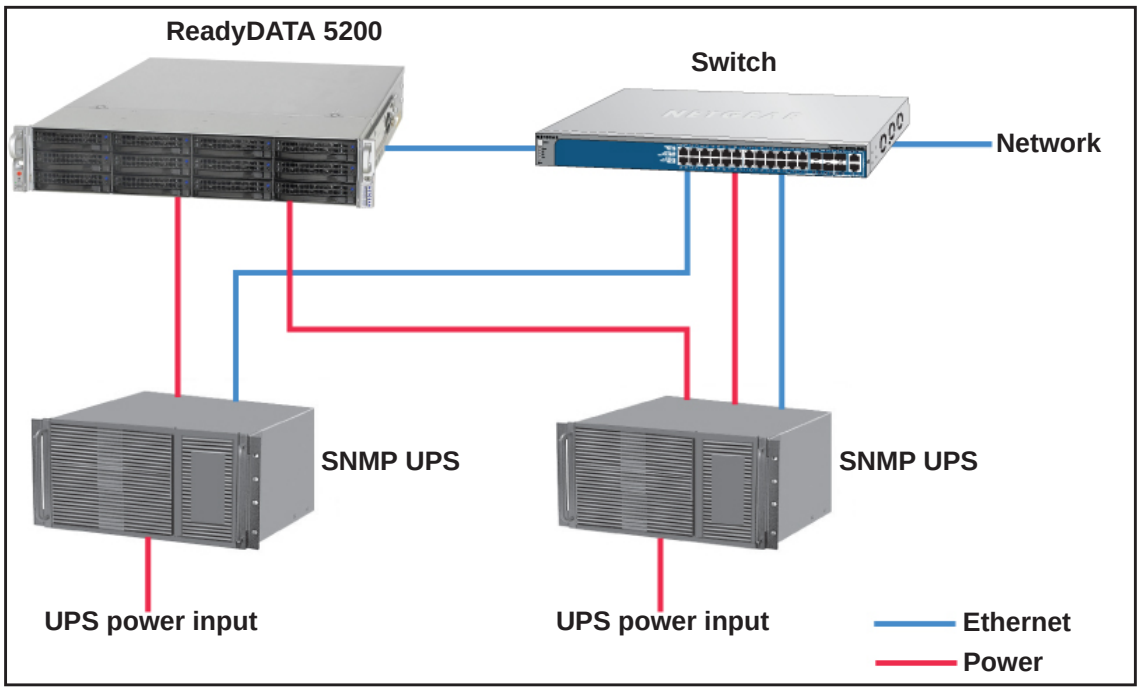


Figure 9. ReadyDATA with dual UPS devices managed over SNMP

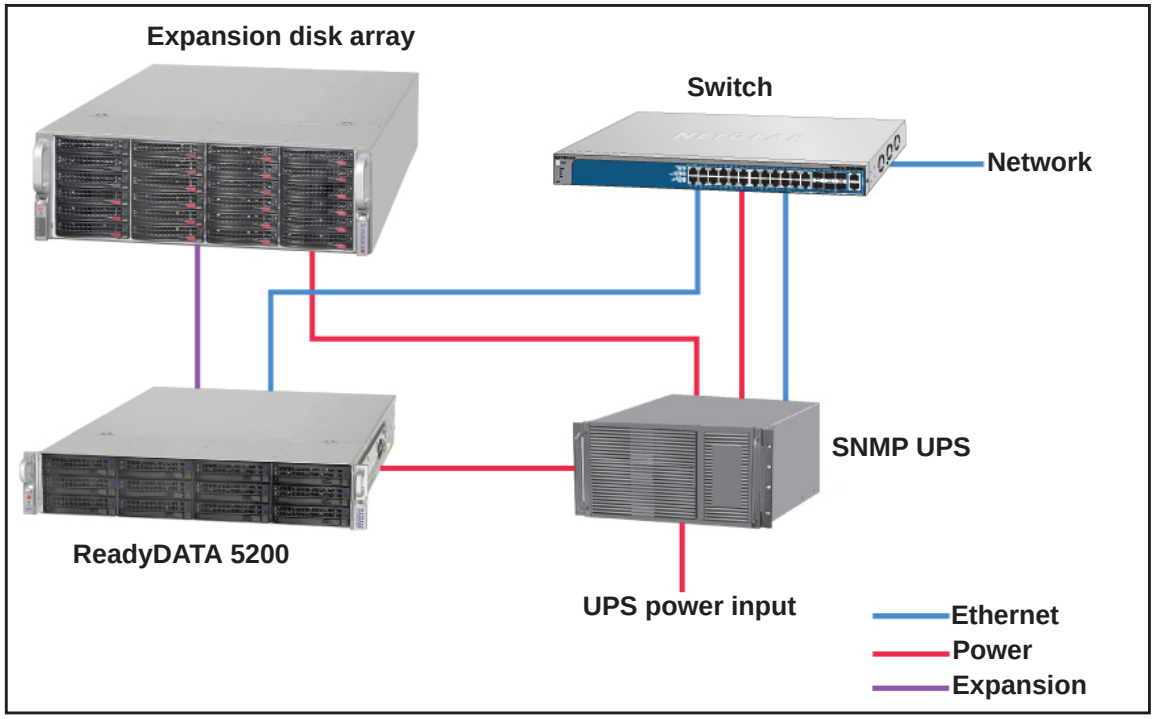


Figure 10. ReadyDATA and expansion disk array with a UPS managed over SNMP

UPS Devices Managed Over a Remote Connection

A remote UPS is attached to a remote server, such as a ReadyNAS or a Linux server that is running Network UPS Tools (NUT). The ReadyDATA monitors and manages the UPS over the remote connection. The Ethernet connection between the UPS and the ReadyDATA passes through a switch.

The following figures show scenarios that include a UPS that is managed over a remote connection. Although dual power supplies and dual UPS devices are not shown in these figures, for full power protection, each power supply should be connected to a UPS.

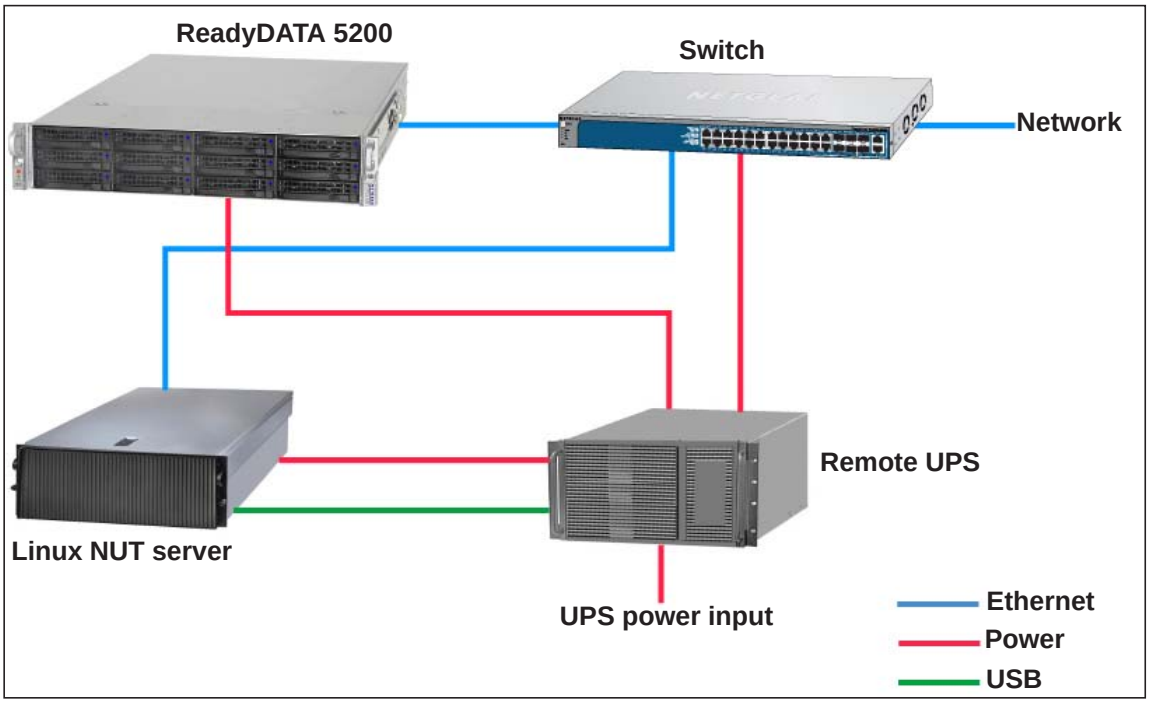


Figure 11. ReadyDATA with a UPS managed remotely over a Linux NUT server

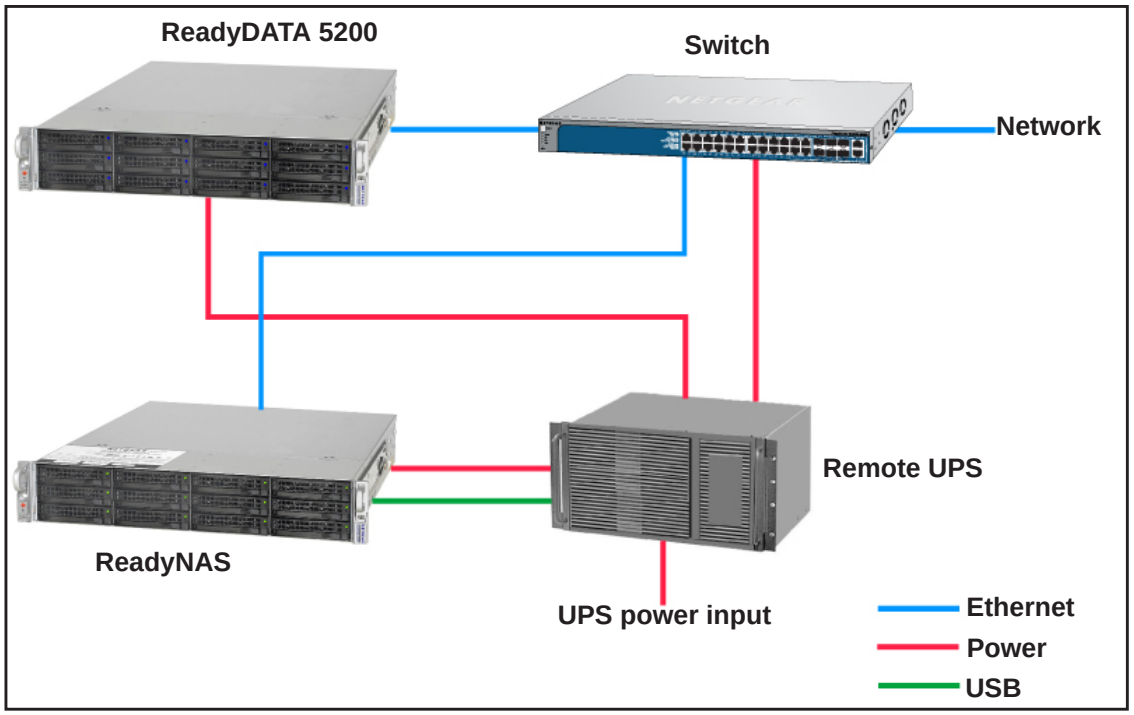


Figure 12. ReadyDATA with a UPS managed remotely over a remote ReadyNAS

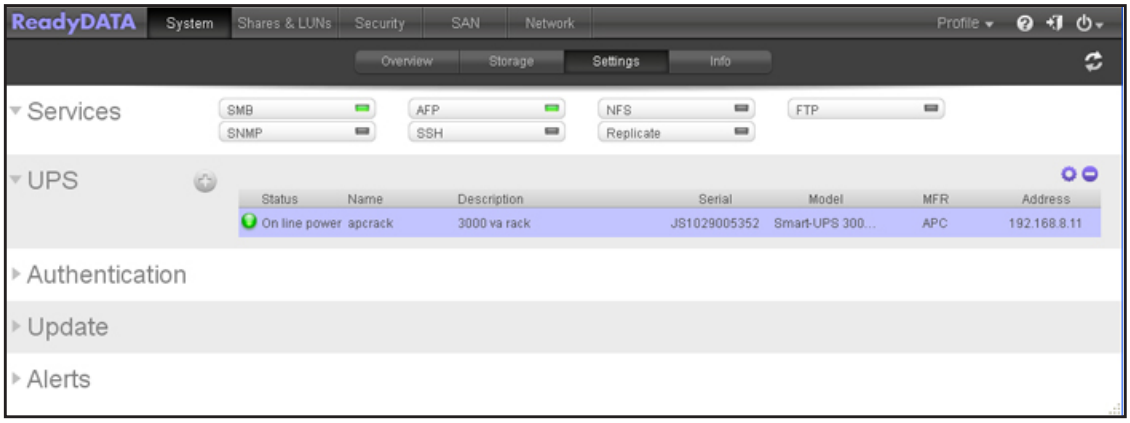
Add and Monitor UPS Devices

You can add up to three UPS devices to Dashboard.

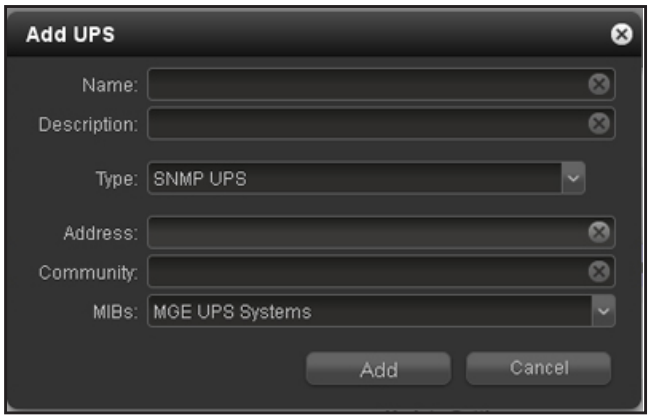
➢ **To add a UPS device to Dashboard and monitor the UPS device:**

1. Select **System > Settings > UPS**.

   The following figure shows the UPS screen with one UPS device already added:



2. Click the **+** button (⊕) to the left of the UPS table. The Add UPS screen displays. The first figure shows the settings for adding an SNMP UPS; the second figure shows the settings for adding a remote UPS.

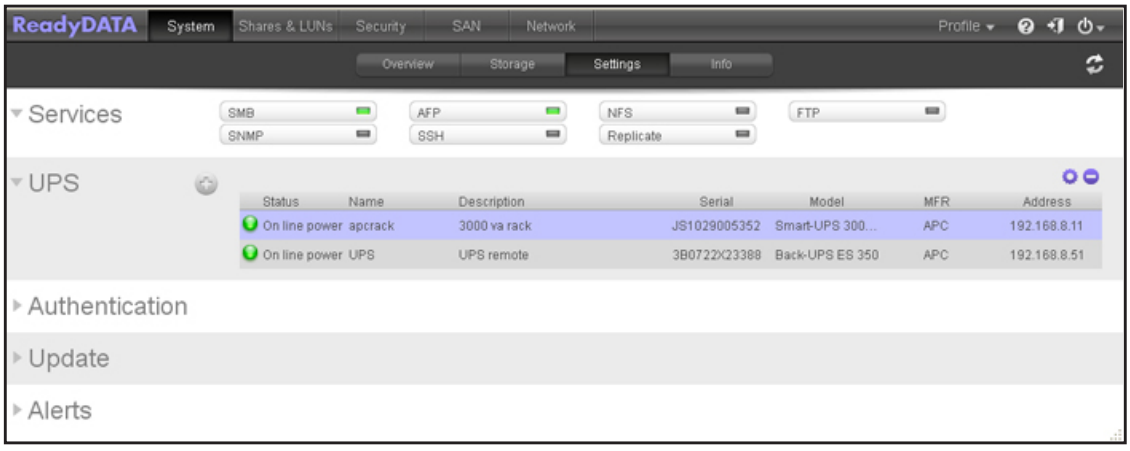


3. Configure the settings as explained in the following table:

Item	Description
Name	Enter a name to identify the UPS: • For an SNMP UPS, enter any name. • For a remote, UPS you do not have any options: you need to enter **UPS**.
Description	An optional description to help identify the UPS.
Type	From the drop-down list, select one of the following options: • **SNMP UPS**. An SNMP UPS lets the ReadyDATA query the manufacturer-specific MIB. The ReadyDATA monitors and manages the UPS through SNMP. • **Remote UPS**. A remote UPS is attached to a remote server, such as a ReadyNAS or a Linux server that is running Network UPS Tools (NUT). The ReadyDATA monitors and manages the UPS over the remote connection.

Item		Description
SNMP UPS	Address	Enter the IP address of the SNMP UPS.
	Community	Enter public or private, depending on the manufacturer's requirement or the UPS's configuration.
	MIB	From the drop-down list, select the MIB for one of the following manufacturers: • **MGE UPS Systems** • **American Power Conversion (APC)** • **SOCOMEC** • **Powerware** • **Eaton Powerware (Monitored)** • **Eaton Powerware (Managed)** • **Raritan** • **BayTech** • **HP/Compac AF401A** • **Cyberpower RMCARD201/RMCARD100/RMCARD202**
Remote UPS	Address	Enter the IP address of the remote UPS.
	User	For a remote UPS that is attached to a Linux server that is running NUT, enter the user name to access the remote UPS. For a remote UPS that is attached to a ReadyNAS, enter **monuser**. This user name is required for the ReadyDATA to access the remote UPS; do not enter another user name.
	Password	For a remote UPS that is attached to a Linux server that is running NUT, enter the password to access the remote UPS. For a remote UPS that is attached to a ReadyNAS, enter **pass**. This password is required for the ReadyDATA to access the remote UPS; do not enter another password.

4. Click **Add**. The UPS device is added to the UPS table.



The following table explains the columns of the UPS table:

Item	Description
Status	The status of the UPS. These are the options: • On line power • On battery • Low battery • On battery and Low battery • On line power and Low battery • Unknown
Name	The name of the UPS. For a remote UPS, the name is always UPS.
Description	The description that you gave to the UPS.
Serial	The detected serial number of the UPS.
Model	The detected model of the UPS.
MFR	The detected manufacturer of the UPS.
Address	The IP address of the UPS.

➢ **To edit a UPS device in the UPS table:**

1. In the UPS table, highlight the UPS device that you want to modify.
2. Click the gear icon to the right of the UPS table. The UPS Settings screen displays. The fields on this screen are identical to the Add UPS screen (see the figures in *Step 2* of the previous procedure).
3. Modify the settings as required. You cannot change the type settings.
4. Click **Apply**. The modified UPS settings are displayed in the UPS table.

➢ **To remove a UPS device from the UPS table:**

1. In the UPS table, highlight the UPS device that you want to remove.
2. Click the **-** button to the right of the table.
3. Confirm the removal. The UPS device is removed from the UPS table.

7. Backup, Replication, and Recovery

This chapter describes how to configure snapshots for backup and recovery and how to configure replication between two ReadyDATA storage systems. It contains the following sections:

- *Manage Snapshots for Shares and LUNs*
- *Recover Data from a ReadyDATA to an Attached Device*
- *Manage Replication and Recovery between Two or More Systems*

> **Note:** Without a volume, you cannot configure any shares or LUNs. Without shares or LUNs, you cannot configure any snapshots. For information about how to configure volumes, see *Chapter 2, Manage Disks and Volumes*. For information about how to configure shares and LUNs, see *Chapter 4, Manage Shares and LUNs*.

Manage Snapshots for Shares and LUNs

Basic Snapshot Concepts

The ReadyDATA can provide protection of shares and LUNs through snapshots. Snapshots contain references to data on a share or LUN. Strictly speaking, snapshots are not backups, but they function as backups because you can recover data from snapshots.

You can only take snapshots of folders or LUNs. You cannot take a snapshot of a volume. Snapshots reside on the same volume as the folder or LUN from which they were created.

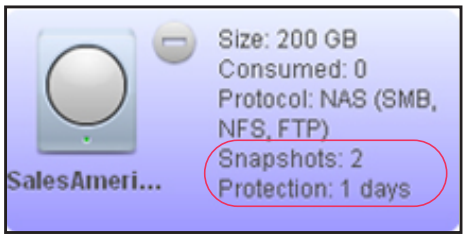
The ReadyNAS can automatically take snapshots of a folder or LUN according to a schedule that you specify. You can also manually take or delete individual snapshots at any time. Depending on available storage space, you can keep an unlimited number of snapshots.

If you configure both snapshots and continuous replication (see *Manage Replication and Recovery between Two or More Systems* on page 173), you have continuous protection.

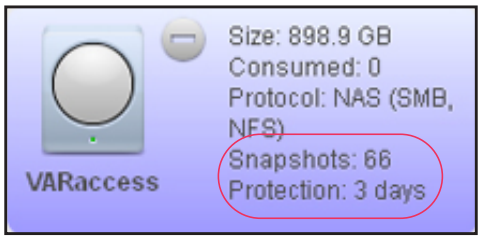
WARNING:

When the available storage space on a volume decreases below 200 GB, the oldest automatic snapshots are automatically deleted to bring the available storage space back to 200 GB or higher. Manual snapshots are never automatically deleted.

Once protection is available, the shares and LUNs on the Shares screen indicate the number of snapshots and the number of days with protection (a share with daily protection is shown on the left; a LUN with hourly protection is shown on the right):



Shared folder with daily snapshots



Shared folder with hourly snapshots

Figure 13. Shares with snapshots

Note: For snapshots to be accessible to users from their network-attached device, you need to select the **Allow snapshot access** check box in the Protection section of the Properties pane of a share. For more information, see *View and Change the Properties of a Share* on page 73.

Rolling back

You can replace a folder or LUN with an earlier version by rolling back to a snapshot. When you roll back to a snapshot, the entire folder or LUN is replaced with the version captured by the snapshot. All snapshots that were taken *after* the snapshot that was used for rolling back are deleted. For information about how to roll back to a snapshot, see *Roll Back to a Snapshot* on page 162.

Clones

You can copy a snapshot to become a new independent data set (that is, a new share or LUN). Changes made to the clone do not affect the parent (“origin”) and changes made to the parent do not affect the clone. To handle storage in an efficient way, common blocks of data between the parent and the clone are shared. Because the clone is linked to the parent in this way, the parent cannot be deleted when a clone exists. Additionally, the clone cannot be migrated to a volume that does not contain the parent. For information about how to clone snapshots, see *Clone a Snapshot* on page 165.

Automatic and Manual Snapshots

You can configure the system to take snapshots according to a schedule that you specify or manually take snapshots.

Automatic Snapshots

When you create a share or LUN (or when you change the properties of a share or LUN), you can select continuous and automatic protection with hourly, daily, or weekly snapshots:

- For information about configuring automatic snapshots of a share, see *Create a Share* on page 70.
- For information about configuring automatic snapshots of a LUN, see *Create a LUN* on page 92.

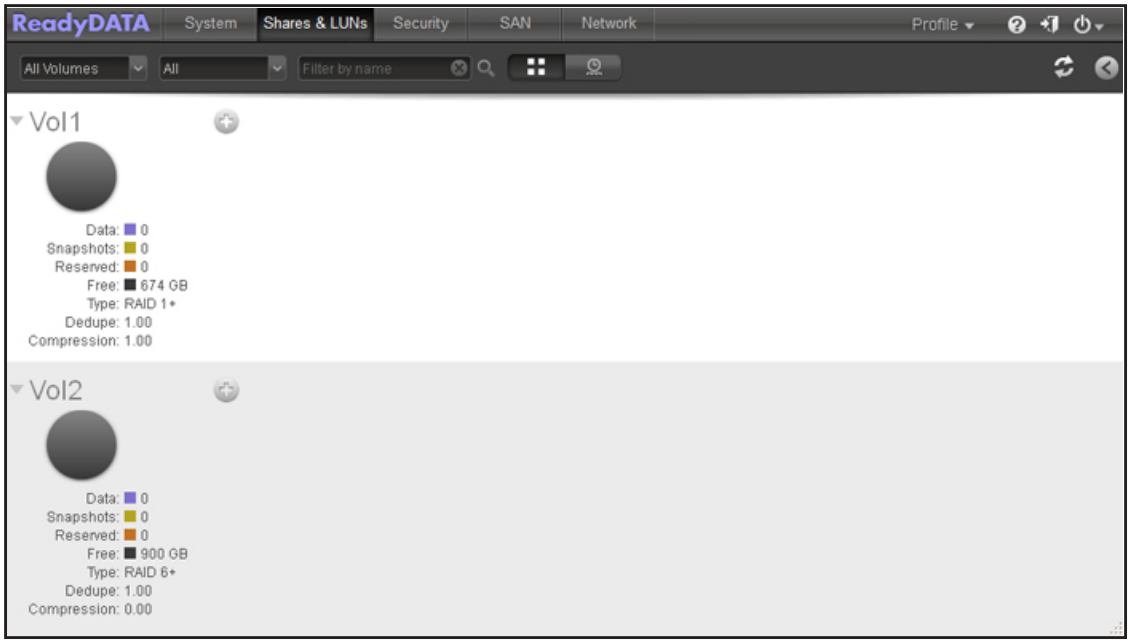
Manually Take a Snapshot

You can take a manual snapshot either from the Shares screen or from the Snapshot screen.

➢ **To take a snapshot of a share or LUN manually from the Shares screen:**

1. Select **Shares**.
2. Click the **Data Set** button (with four cubes,).

   The Shares screen displays:

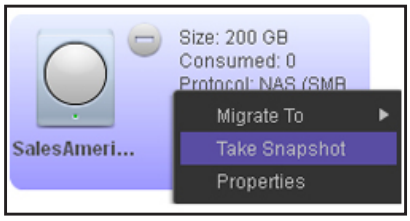


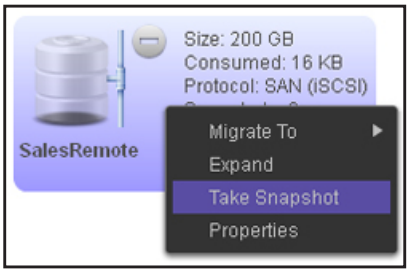
3. Select the share or LUN for which you want to take a manual snapshot by clicking it.

   The color of the share or LUN turns purple.

4. Right-click a share or LUN.

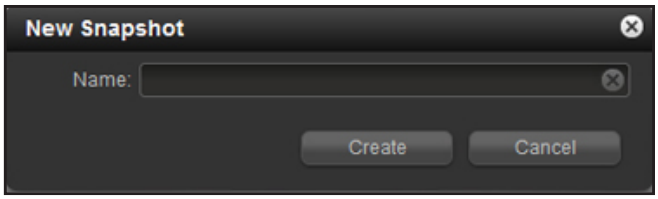
   A pop-up menu displays. In the following figure, the share pop-up menu is shown on the left; the LUN pop-up menu is shown on the right.





5. Select **Take Snapshot**.

   The New Snapshot pop-up screen displays:



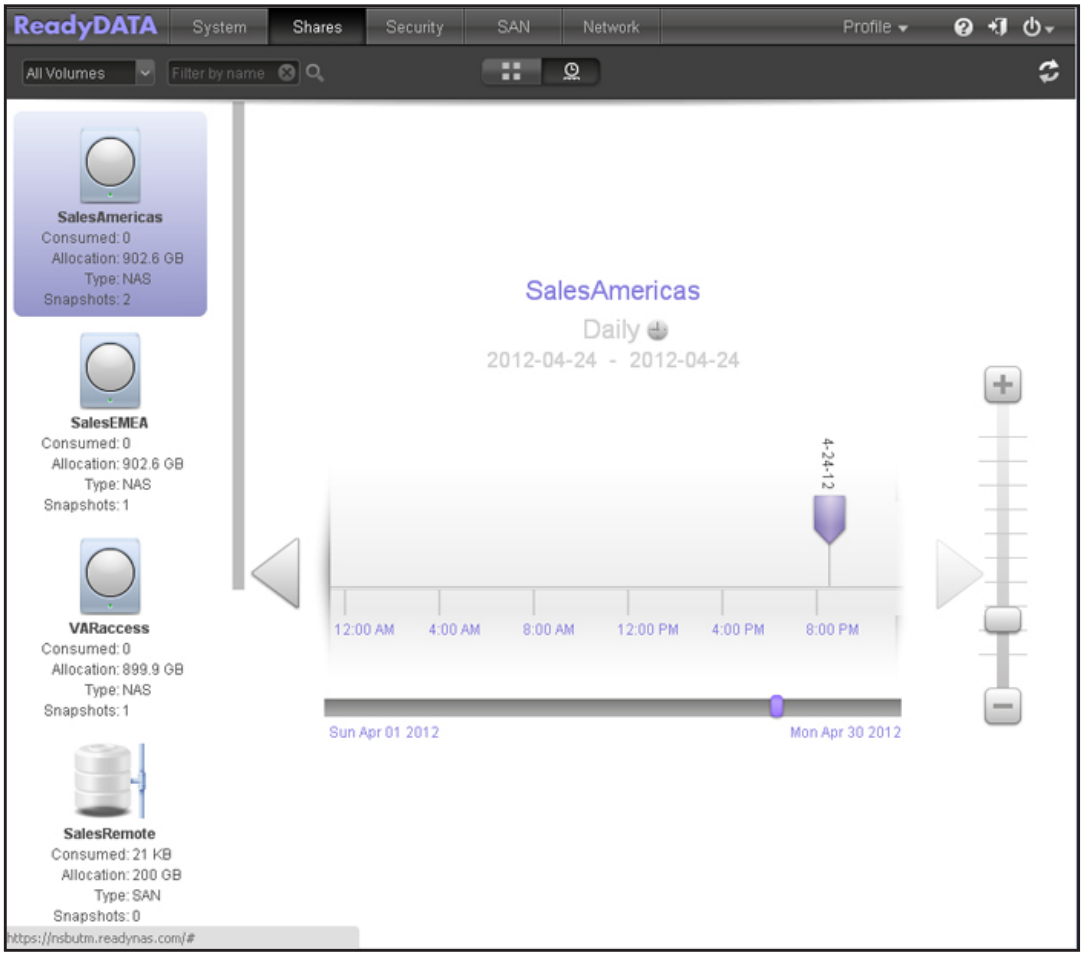
6. Enter a name for the snapshot.
7. Click **Create**.

   The snapshot is created.

➢ **To take a snapshot of a share or LUN manually from the Snapshot screen:**

1. Select **Shares**.
2. Click the **Snapshot** button (with a clock,).

   The Snapshot screen displays:

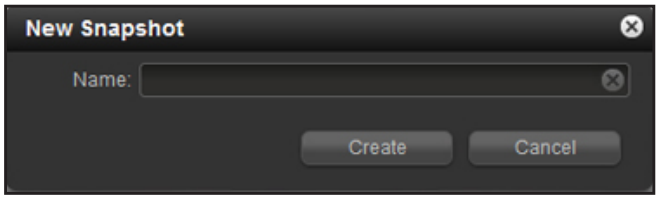


3. On the left side of the screen, select the share or LUN for which you want to take a manual snapshot by clicking it.

The color of the share or LUN turns purple.

4. Right-click a share or LUN.
5. Select **Take Snapshot**.

   The New Snapshot pop-up screen displays:



6. Enter a name for the snapshot.
7. Click **Create**.

   The snapshot is created.

Roll Back to a Snapshot

You can replace a share or LUN with an earlier version by rolling back to a snapshot of that share or LUN.

WARNING:

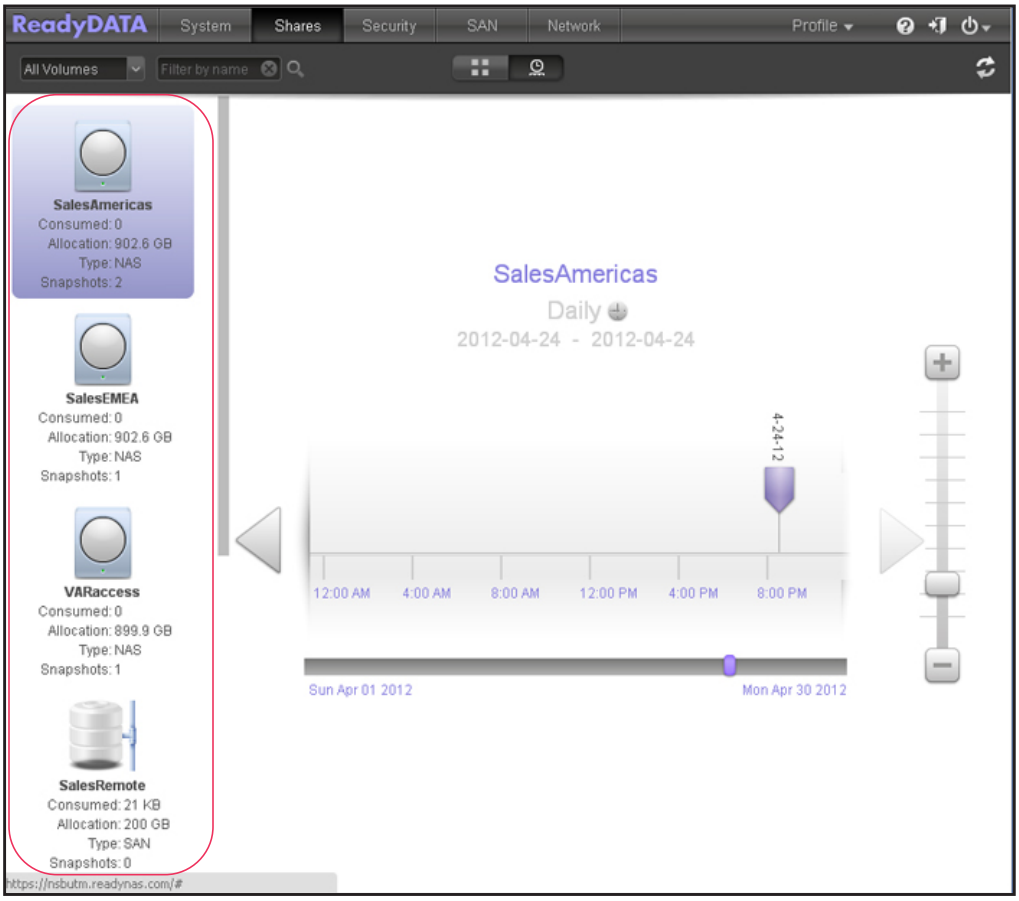
Rolling back is a destructive process. *All* snapshots that were taken after the selected snapshot are deleted.

➢ **To roll back to a snapshot using the snapshot timeline:**

1. Select **Shares**.
2. Click the **Snapshot** button (with a clock, ).

   The Snapshot screen displays.

The shares and LUNs are displayed on the left of the screen.

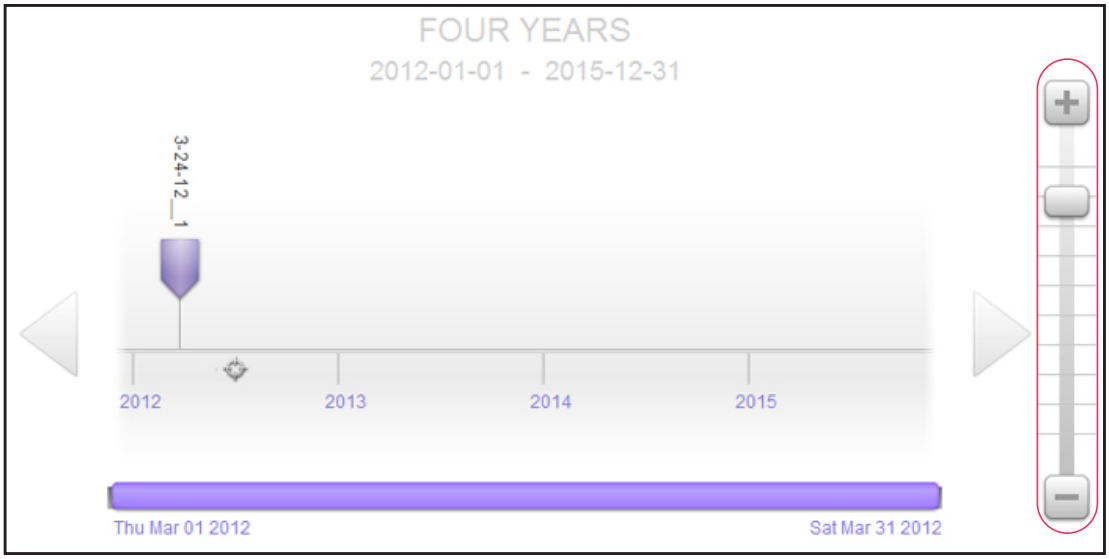


3. Select the share or LUN whose snapshots you want to view.
4. Locate the snapshot using the controls on the timeline.

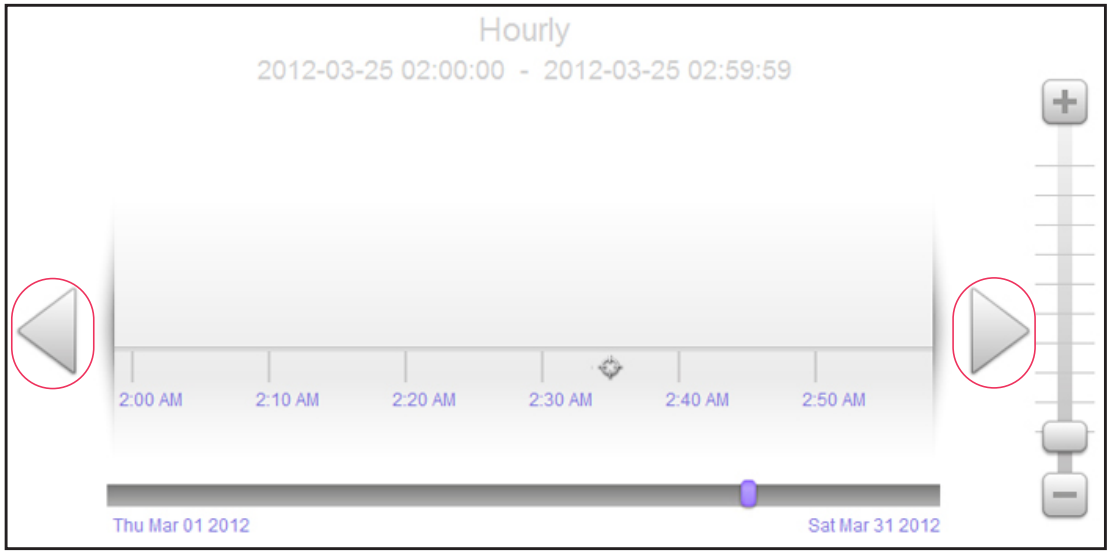
   Snapshots are displayed as purple marker icons along the timeline.

   - The timeline centers on the zoom icon ( ) as you zoom in and out. You can move the zoom icon by clicking anywhere along the timeline. Moving the zoom icon establishes a new center of focus when you zoom in and out.

- Adjust the vertical slider on the right of the timeline as needed. To expand the timeline to years, click the **+** button. To limit the timeline to hours, click the **-** button.

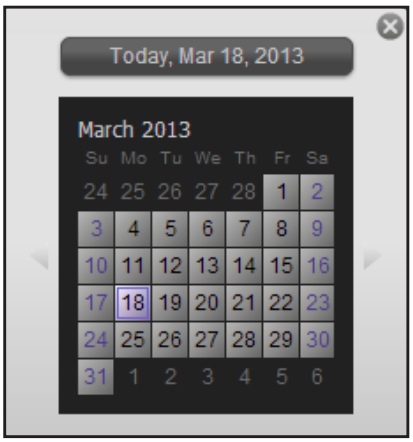


- Use the arrow buttons to the left and right of the timeline as needed to move forward in time (right arrow button) or back in time (left arrow button) in time.

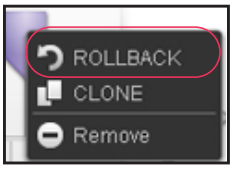


Note: *The snapshot is not shown in the previous screen because it was not taken in the 2:00 AM–2:50 AM timespan.*

Tip: Click the **clock** icon that is located in the middle of the Snapshot screen under the name of the selected share or LUN. A calendar pop-up screen displays, allowing you to jump to a desired month and date.



5. Right-click the snapshot that you want to roll back to.
6. From the pop-up menu that displays, select **Rollback**.



7. Confirm your decision by clicking **Yes**.

   The share or LUN is rolled back to the snapshot that you selected.

Clone a Snapshot

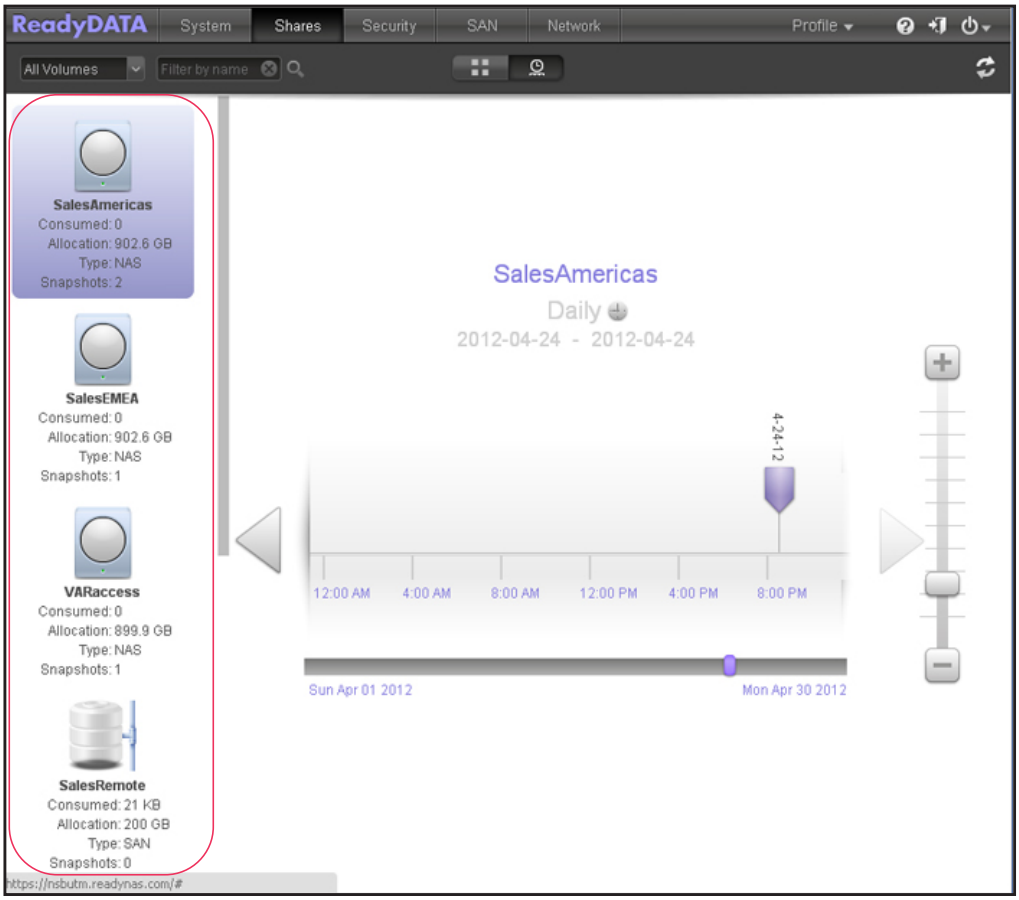
You can copy a snapshot to become a new independent data set (that is, a new share or LUN). Changes made to the clone do not affect the parent (“origin”) and changes made to the parent do not affect the clone. To handle storage in an efficient way, common blocks of data between the parent and the clone are shared. Because the clone is linked to the parent in this way, the parent cannot be deleted when a clone exists. Additionally, the clone cannot be migrated to a volume that does not contain the parent.

➢ **To roll back to a snapshot using the snapshot timeline:**

1. Select **Shares**.
2. Click the **Snapshot** button (with a clock, ).

   The Snapshot screen displays.

The shares and LUNs are displayed on the left of the screen.

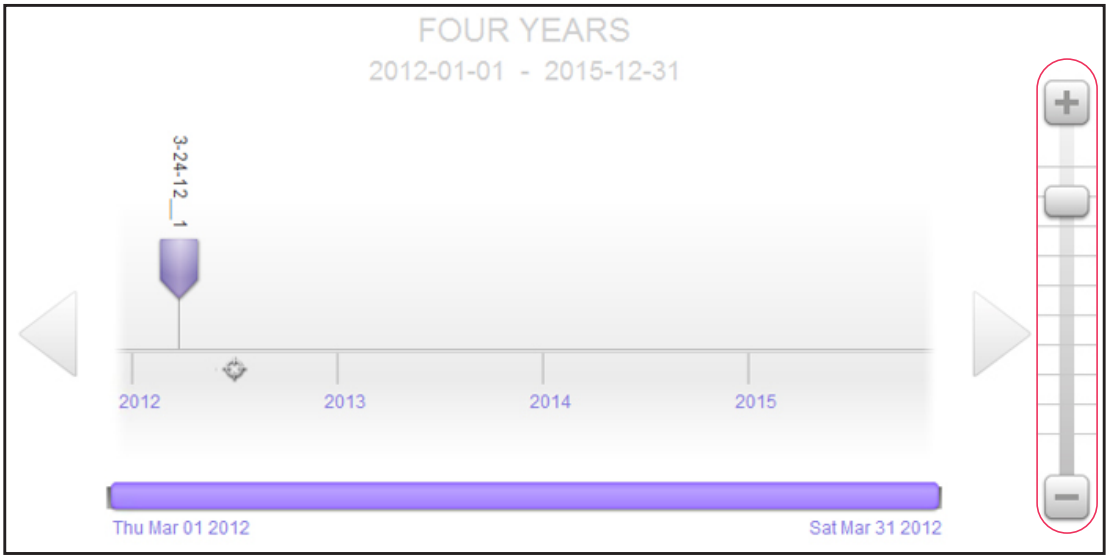


3. Select the share or LUN whose snapshots you want to view.
4. Locate the snapshot using the controls on the timeline.

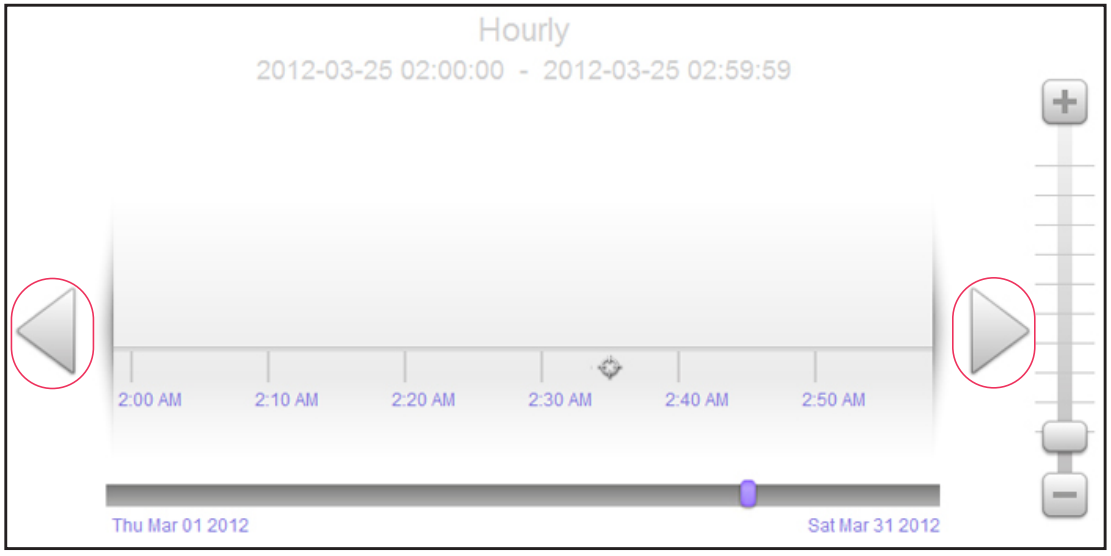
   Snapshots are displayed as purple marker icons along the timeline.

   - The timeline centers on the zoom icon ( ) as you zoom in and out. You can move the zoom icon by clicking anywhere along the timeline. Moving the zoom icon establishes a new center of focus when you zoom in and out.

- Adjust the vertical slider on the right of the timeline as needed. To expand the timeline to years, click the **+** button. To limit the timeline to hours, click the **-** button.

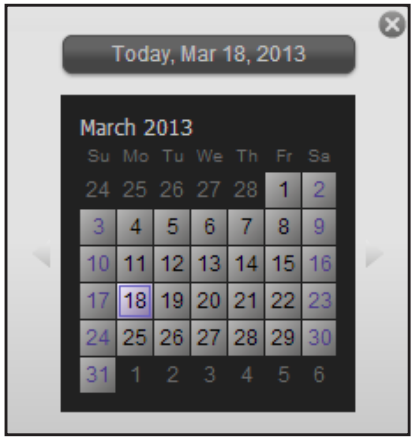


- Use the arrow buttons to the left and right of the timeline as needed to move forward in time (right arrow button) or back in time (left arrow button) in time.

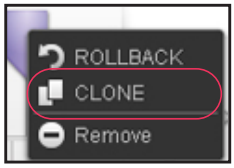


Note: *The snapshot is not shown in the previous screen because it was not taken in the 2:00 AM–2:50 AM timespan.*

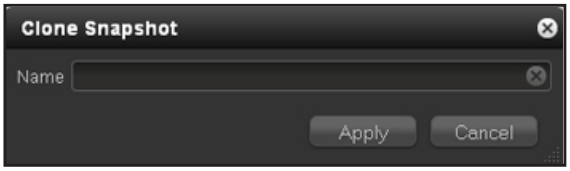
Tip: Click the **clock** icon that is located in the middle of the Snapshot screen under the name of the selected share or LUN. A calendar pop-up screen displays, allowing you to jump to a desired month and date.



5. Right-click the snapshot that you want to clone.
6. From the pop-up menu that displays, select **Clone**.



A pop-up screen displays:



7. In the Name field, enter a new name for the share or LUN.
8. Click **Apply**.

   A cloned snapshot is added to the Shares screen as a new share or LUN. A new share is immediately accessible to users. A new LUN first needs to be added to a LUN group before users can gain access to it.

Delete a Snapshot

You can enable Smart Snapshot Management to automatically prune older snapshots and you can manually delete snapshots.

Smart Snapshot Management

When you create a share or LUN (or when you change the properties of a share or LUN), you can enable Smart Snapshot Management. Smart Snapshot Management provides an easy

way to reduce the total number of historical snapshots per share or LUN. When enabled, this feature automatically deletes older hourly and daily snapshots so that hourly snapshots are kept for 48 hours, daily snapshots are kept for 4 weeks, weekly snapshots are kept for 8 weeks, and monthly snapshots are kept indefinitely.

- For information about enabling Smart Snapshot Management for a share, see *Create a Share* on page 70.
- For information about enabling Smart Snapshot Management for a LUN, see *Create a LUN* on page 92.

Manually Delete a Snapshot

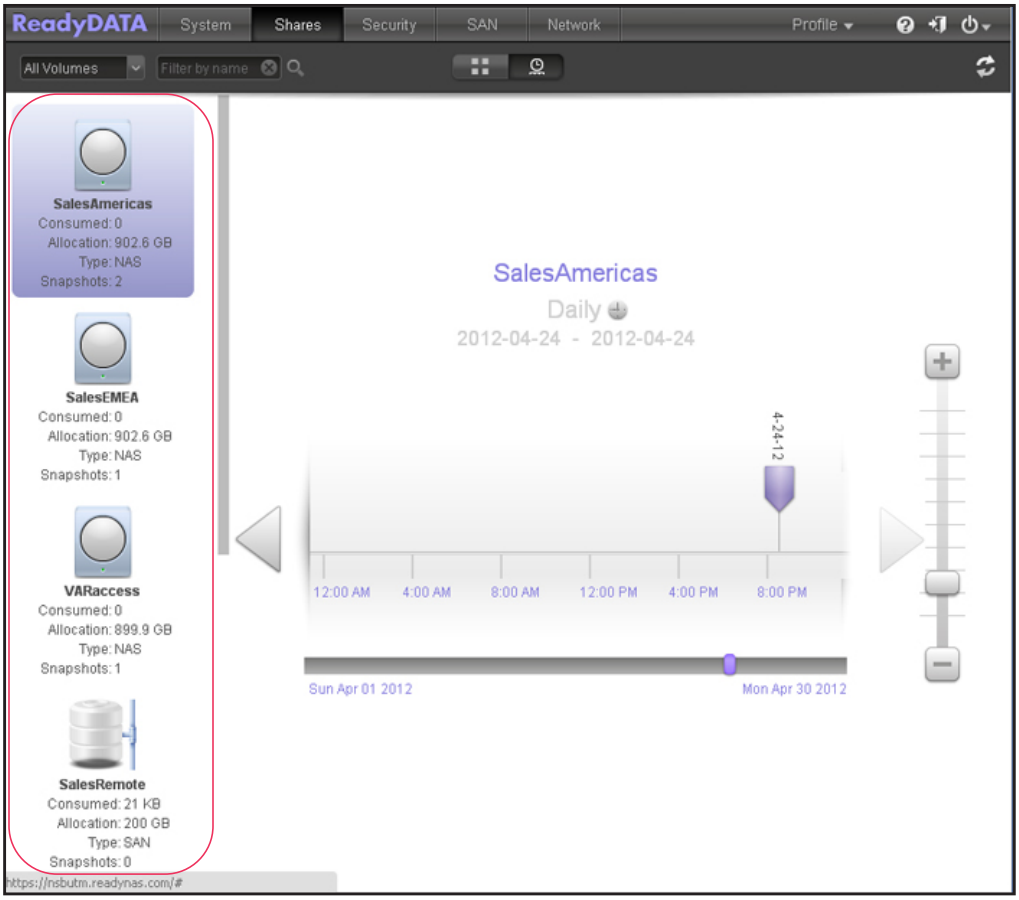
You can manually delete snapshots from the Snapshots screen.

➢ **To manually delete a snapshot:**

1. Select **Shares**.
2. Click the **Snapshot** button (with a clock,).

   The Snapshot screen displays.

   The shares and LUNs are displayed on the left of the screen.

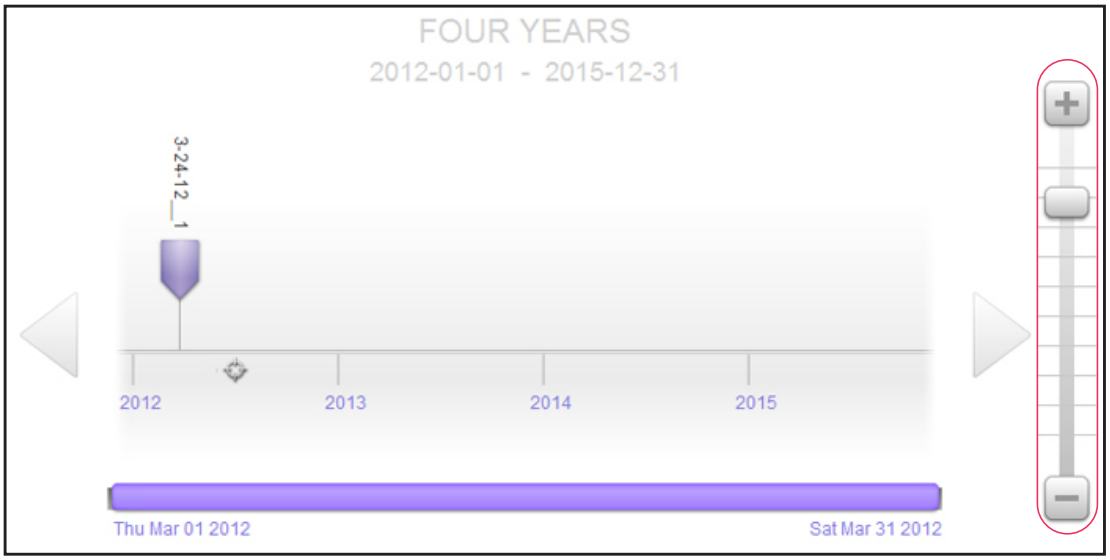


3. Select the share or LUN whose snapshots you want to view.

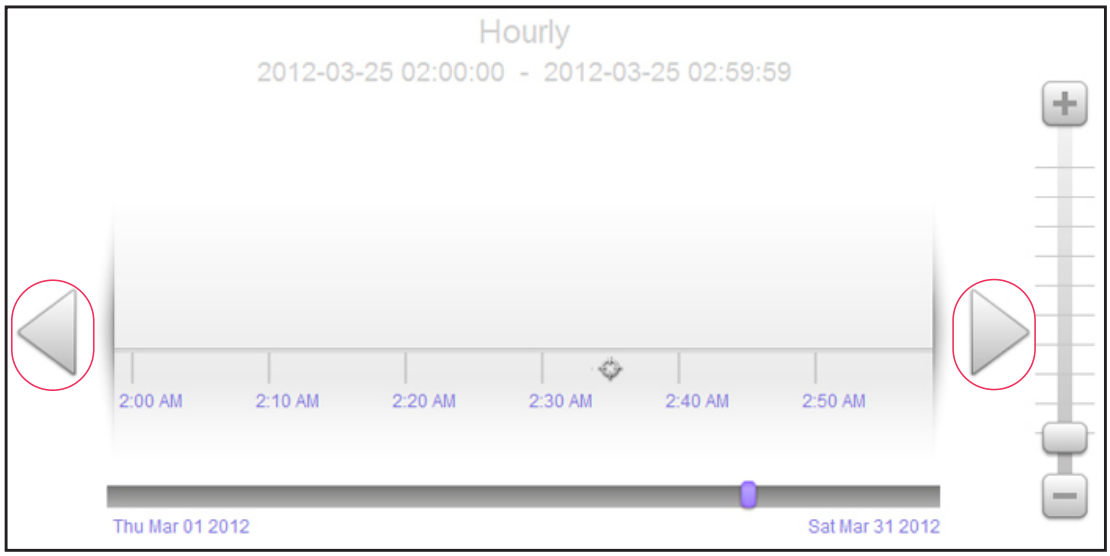
4. Locate the snapshot using the controls on the timeline.

   Snapshots are displayed as purple marker icons along the timeline.

   - The timeline centers on the zoom icon ( ) as you zoom in and out. You can move the zoom icon by clicking anywhere along the timeline. Moving the zoom icon establishes a new center of focus when you zoom in and out.
   - Adjust the vertical slider on the right of the timeline as needed. To expand the timeline to years, click the **+** button. To limit the timeline to hours, click the **-** button.

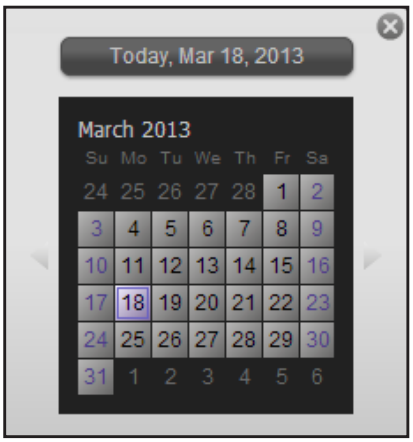


   - Use the arrow buttons to the left and right of the timeline as needed to move forward in time (right arrow button) or back in time (left arrow button) in time.

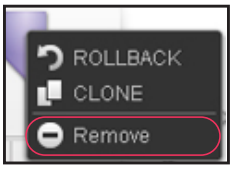


Note: *The snapshot is not shown in the previous screen because it was not taken in the 2:00 AM–2:50 AM timespan.*

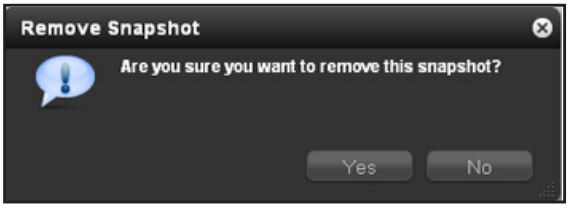
Tip: Click the **clock** icon that is located in the middle of the Snapshot screen under the name of the selected share or LUN. A calendar pop-up screen displays, allowing you to jump to a desired month and date.



5. Right-click the snapshot that you want to delete.
6. From the pop-up menu that displays, select **Remove**.



A pop-up screen displays:



7. Confirm your decision by clicking **Yes**.

The selected snapshot is deleted.

Recover Data from a ReadyDATA to an Attached Device

- *Recover Data from a Snapshot to a Network-Attached Device*
- *Recover Data from a Snapshot to an iSCSI-Attached Device*

Users can employ any back-up application to back up data from their network-attached device to a share or from their iSCSI-attached device to a LUN on the ReadyDATA, and simply access the backed-up data on the share or LUN.

Users who do not back up their data can still be protected from data loss if you provide them access to data that is available in a snapshot on the ReadyDATA. Access to snapshots differs according to the type of attached device that a user employs.

Recover Data from a Snapshot to a Network-Attached Device

For snapshots to be accessible to users from their network-attached device, you need to select the **Allow snapshot access** check box in the Protection section of the Properties pane of a share. For more information, see *View and Change the Properties of a Share* on page 73.

After you make snapshots available, users with a network-attached device have access to the snapshots that reside on a share on the ReadyDATA according to their access rights.

For those users with read/write access to the share, recovering data is a simple process: They click the snapshot subfolder in a share, and then have access to all snapshots that are available on that share. Users can explore the data that is available in a snapshot and recover any desired file or folder.

For information about how to access a share, see *Access a Share from Network-Attached Device* on page 111.

Recover Data from a Snapshot to an iSCSI-Attached Device

Strictly speaking, users who access the ReadyDATA through an iSCSI-attached device do not have access to snapshots. However, you can clone a snapshot of a LUN to become a new independent LUN, and then assign that LUN clone to a LUN group that the users can access.

Cloning a snapshot to become a LUN is an instantaneous process that does not consume additional storage space, unless more data is written to the clone. Because no additional storage space is consumed, cloning snapshots is very efficient.

In order to recover data from the LUN clone, users must access the LUN clone from the same type of iSCSI-attached device that was used to format the parent of the clone. For example, if the parent LUN was formatted using a Windows device, users must access the LUN clone using a Windows device.

Recovering data from a snapshot to an iSCSI-attached device involves the following high-level steps:

1. Clone a snapshot of a LUN.

   See *Clone a Snapshot* on page 165. Cloning a snapshot of a LUN creates a new independent LUN.

2. Assign the LUN clone to a LUN group that the users can access.

   See *Assign a LUN to a LUN Group* on page 103.

   The LUN clone appears on the iSCSI-attached device as a virtual block device, The iSCSI-attache device treats LUNs in the LUN group as locally-attached disks. Now users can access the LUN clone from the iSCSI-attached device.

3. Locate the snapshot data on the LUN clone from the iSCSI-attached device.

   Users can access data on the LUN clone according to their access rights. Users who have read/write access to the LUNs in the LUN group can explore the snapshot data in the LUN clone and recover any desired data.

Manage Replication and Recovery between Two or More Systems

- *About Replication*
- *Access ReadyDATA Replicate and Register Systems*
- *Schedule Periodic Replication*
- *Configure Continuous Replication*
- *Recover Data*
- *View the Network*
- *View the Jobs*
- *Monitor the Jobs*
- *Run Job Reports*

The ReadyDATA supports backup and recovery operations through its advanced snapshot functionality. For information about snapshots, see *Manage Snapshots for Shares and LUNs* on page 158. Replication is specifically between two ReadyDATA storage systems on which shares and LUN can be mirrored.

About Replication

Replication capabilities are integrated into the ReadyDATA, and you do not need to install a replication add-on. You can enable replication with the simple click of a button. However, you do need to access the NETGEAR ReadyDATA Replicate™ software application so you can

use its centralized management console to configure the replication settings (see *Access ReadyDATA Replicate and Register Systems* on page 174).

ReadyDATA Replicate supports two types of replication:

- Periodic replication
  This type of replication is driven by the clock. Data is replicated periodically, from once per hour to once per month, based on how you schedule replication. This configuration collects changes that occur over the selected time period and replicates them in line with the replication schedule.
- Continuous replication
  This type of replication is driven by activity at the source system. Data is replicated to the destination device constantly. Whenever new blocks are written on the source system, they are immediately sent to the destination system. In the event of a disaster the most current data possible is in a secondary location. For optimum protection, use constant replication rather than periodic replication.

You can configure replication only per individual share or LUN, that is, you cannot configure replication at the system level. You select a share or LUN as the source of the replication, and a volume on the remote system as the destination for the replication.

The replication process leverages the information that is contained in special hidden snapshots to minimize the time it takes to determine what block-based data needs to be moved between the systems. These hidden snapshots are not the same as the regular snapshots that you create manually or set up to be created automatically.

Replication of an incomplete hidden snapshot resumes from the point where it failed, that is, if a 200-MB snapshot fails to replicate at 90 percent completion, replication resumes at 90 percent completion to replicate the remaining 20 MB.

If you do not use an explicit destination IP address, data that is replicated over the Internet is automatically encrypted for increased safety.

The replication status is reported at both the source and the destination systems in a replication relationship, and includes the age of the snapshot that is transferred and the size of the data that is transferred. For example, if a 50-MB snapshot was created 20 seconds before being transferred to a remote system as part of replication, the status that is reported is *Target is 50 MB / 20 seconds behind source*, or a similar status message.

For more information, see the white paper *Building Backup-to-Disk and Disaster Recovery Solutions with the ReadyDATA 5200* that is available from the ReadyDATA website at *www.netgear.com/readydata*.

Access ReadyDATA Replicate and Register Systems

NETGEAR ReadyDATA Replicate is an online application that provides a simplified, reliable replication solution to protect business data against downtime and disasters.

ReadyDATA Replicate allows data from one ReadyDATA to be replicated and restored to and from another ReadyDATA. Using a centralized web portal, you create, manage, and monitor

replication and restore tasks that operate across ReadyDATA systems from multiple locations.

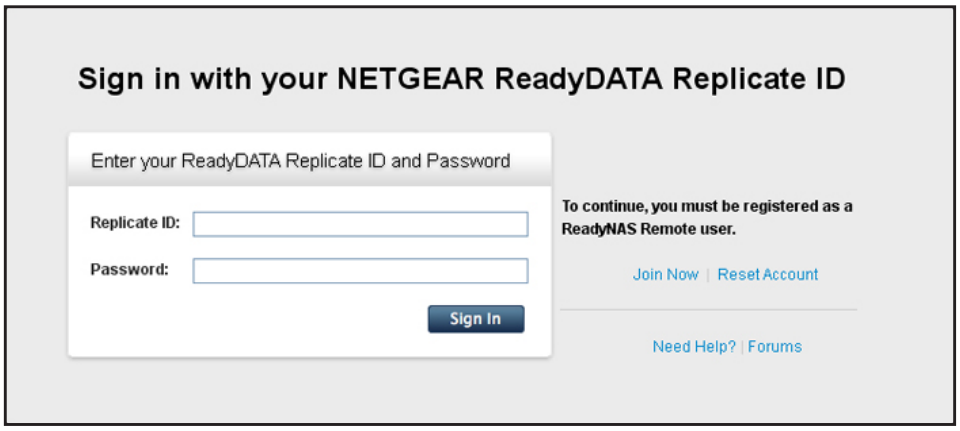
The ReadyDATA provides replication functionality, that is, you do not need to install anything on the ReadyDATA for replication to function. However, you do need to create a ReadyDATA remote ID before you can access ReadyDATA Replicate.

Note: You do not need a license to access ReadyDATA Replicate.

➢ **To access ReadyDATA Replicate and register systems:**

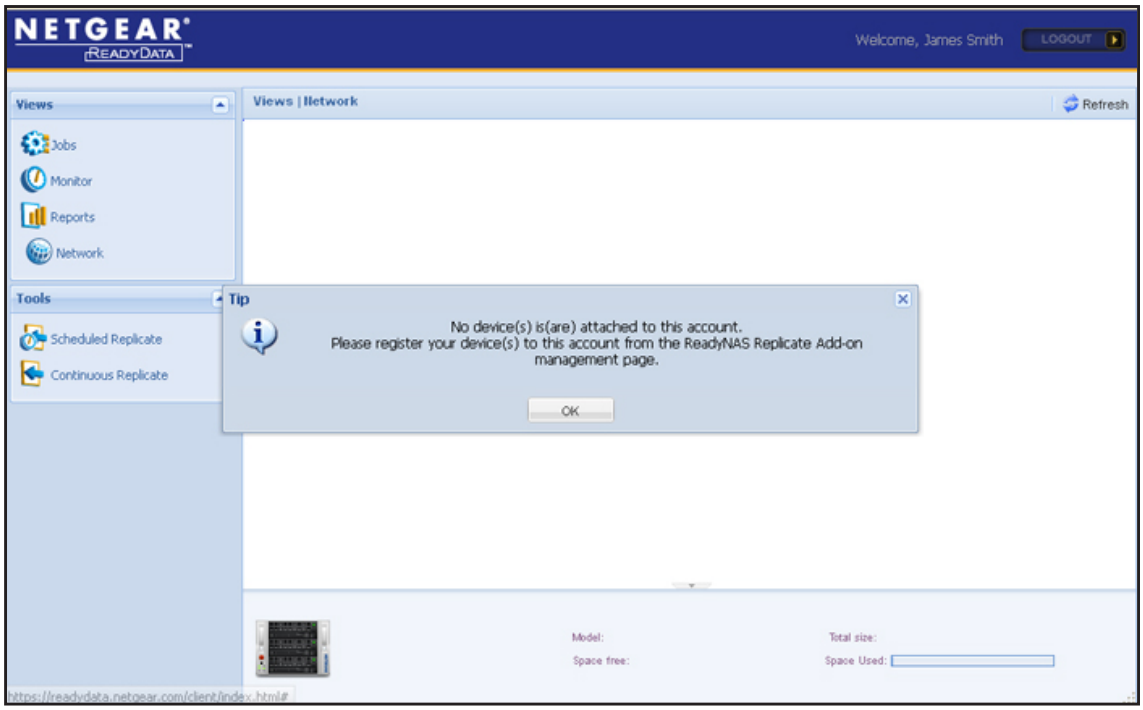
1. Go to *https://readydata.netgear.com*.

   The access screen displays:



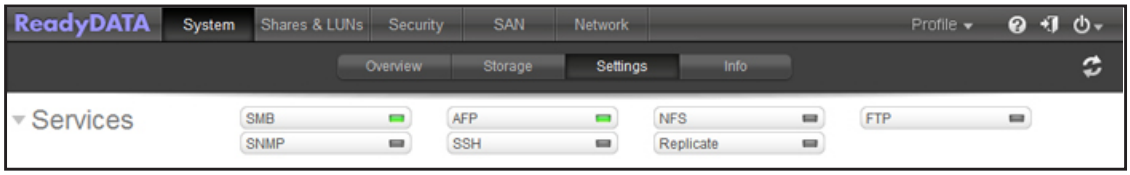
2. (Optional) Click the **Join Now** link to create a remote ID and password, if you do not yet have these.
3. Sign in using your remote ID and password.

   The ReadyDATA Replicate Network screen displays:



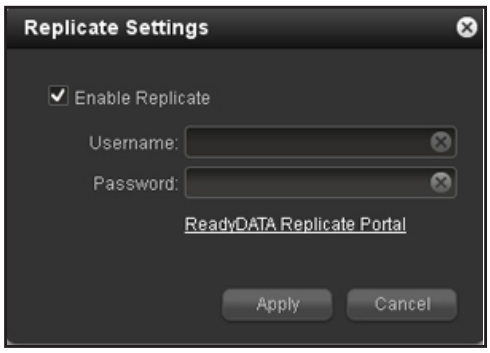
4. On a ReadyDATA that you want to register for replication, open Dashboard.
5. Select **System > Settings > Services** to display the Services section with the file-sharing protocols on the Settings screen.

   The following figure shows the top of the Settings screen only:



6. Click **Replicate**.

   The Replicate Settings pop-up screen displays:



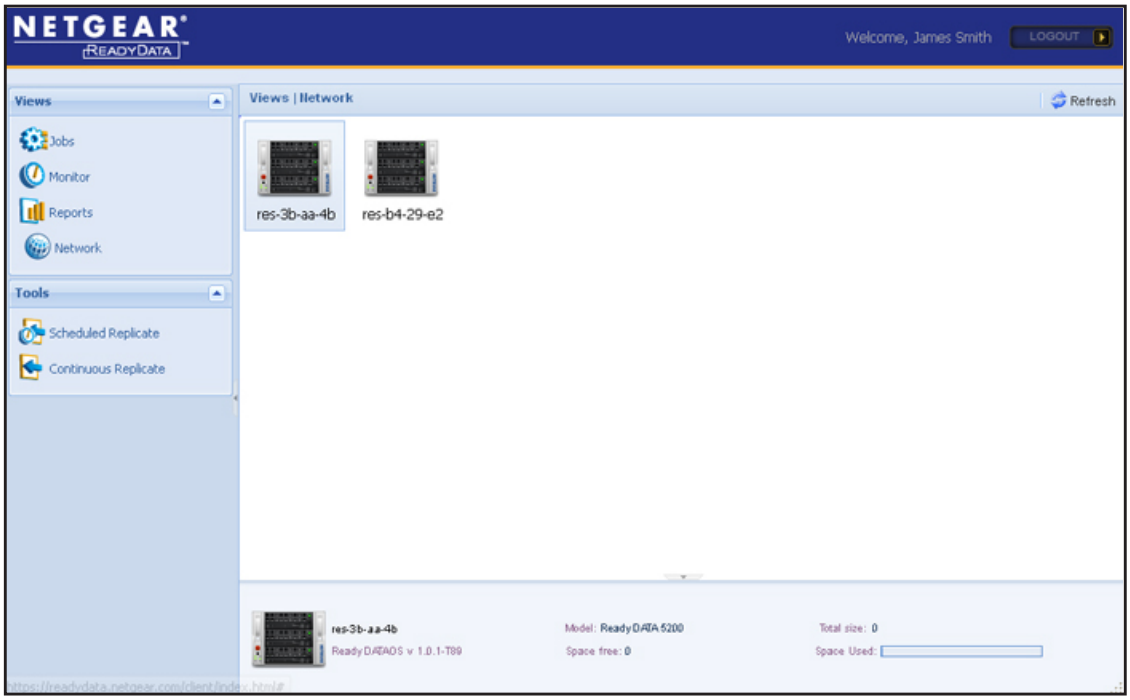
7. Select the **Enable Replicate** check box.

8. Enter the following settings:
   - In the Username field, enter the remote ID that you used to access the ReadyDATA Replicate application in *Step 3*.
   - In the Password field, enter the password that you used to access the ReadyDATA Replicate application in *Step 3*.
9. Click **Apply**.
10. To register another ReadyDATA for replication, repeat *Step 4* to *Step 9*.

After you have registered one or more ReadyDATA systems, the systems display on the ReadyDATA Replicate Network screen.

To display the Replicate Network screen, from the Views menu on the left, select **Network**.

Note: *For the ReadyDATA systems to be displayed, you might have to click* ***Refresh*** *in the upper right corner of the Replicate Network screen.*



Schedule Periodic Replication

After you have registered at least two ReadyDATA systems for ReadyDATA Replicate, you can schedule the replication of a share or LUN from one ReadyDATA to another.

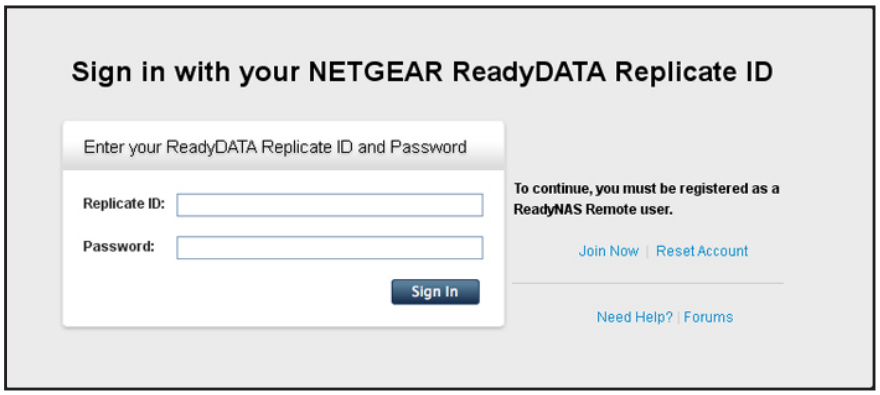
WARNING:

If you disable replication on a registered ReadyDATA, the system is deregistered from ReadyDATA Replicate, and the replication job is deleted. Make sure that replication remains enabled on a registered ReadyDATA that is part of a replication job.

- **To schedule periodic replication of a share or LUN:**

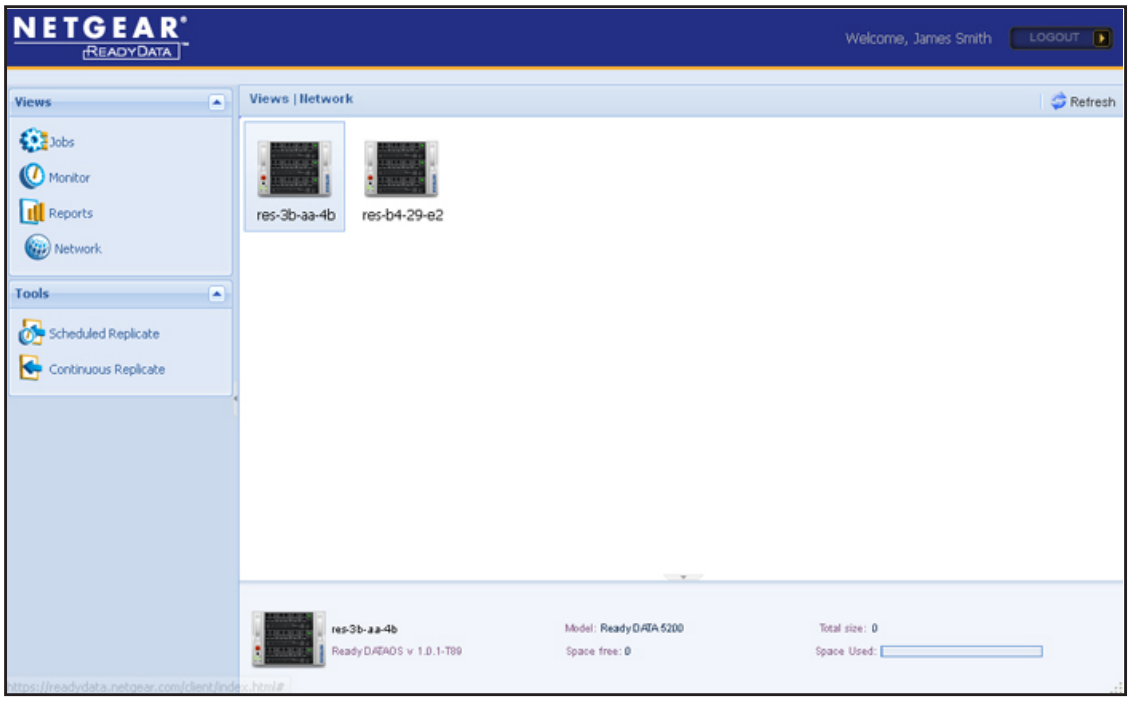
1. Go to *https://readydata.netgear.com*.

   The access screen displays:



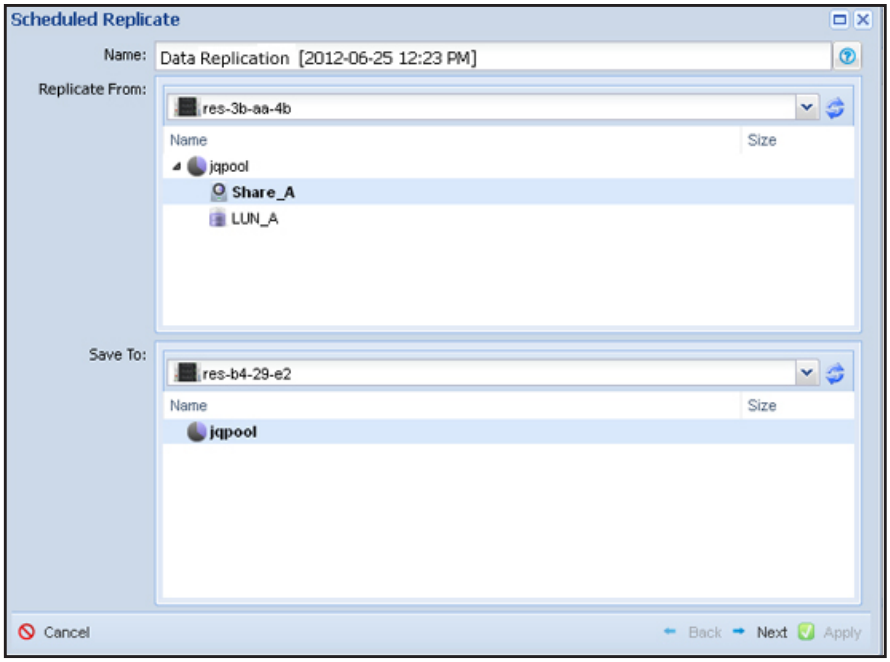
2. Sign in using your remote ID and password.

   The ReadyDATA Replicate Network screen displays:



3. From the Tools menu on the left, select **Scheduled Replicate**.

   The first Scheduled Replicate screen displays:

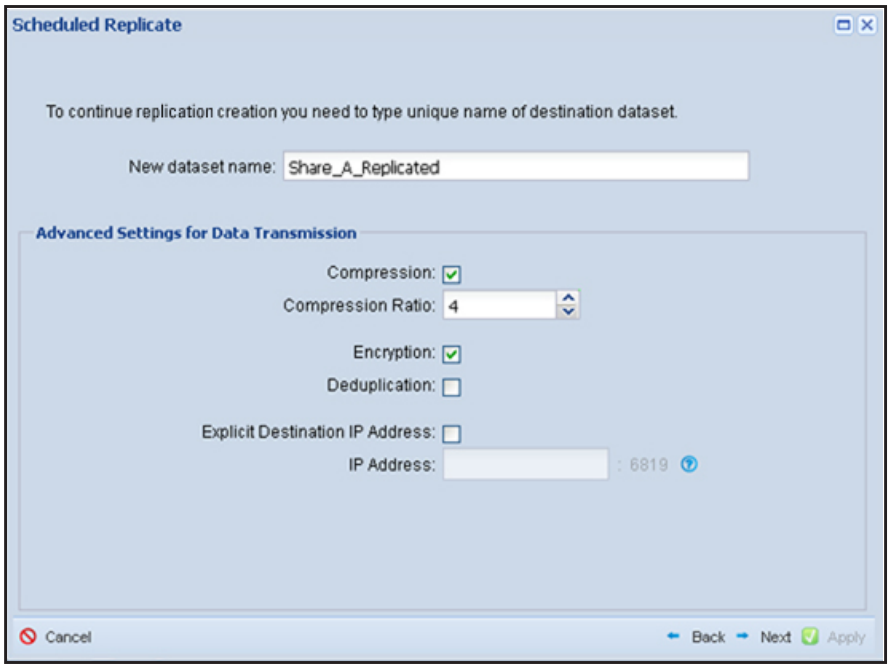


4. Configure the settings on the first screen as explained in the following table:

Item	Description
Name	Keep the default name for the replication configuration, or overwrite the default name with another name.
Replicate From	From the Replicate From drop-down list, select the ReadyDATA from which you want to replicate a share or LUN, that is, select the source system. Then make the following selections: 1. Select the volume on which the share or LUN resides. 2. Double-click the volume. 3. Select the share or LUN.
Save To	From the Save To drop-down list, select the ReadyDATA to which you want to replicate a share or LUN, that is, select the destination system. Then select the volume to which you want to replicate the share or LUN. **Note:** In the previous figure, the name of the volume to which the share or LUN is replicated is identical to the name of the volume from which the share or LUN is replicated. This is not a typical situation.

5. At the bottom right of the screen, click **Next**.

The second Scheduled Replicate screen displays:



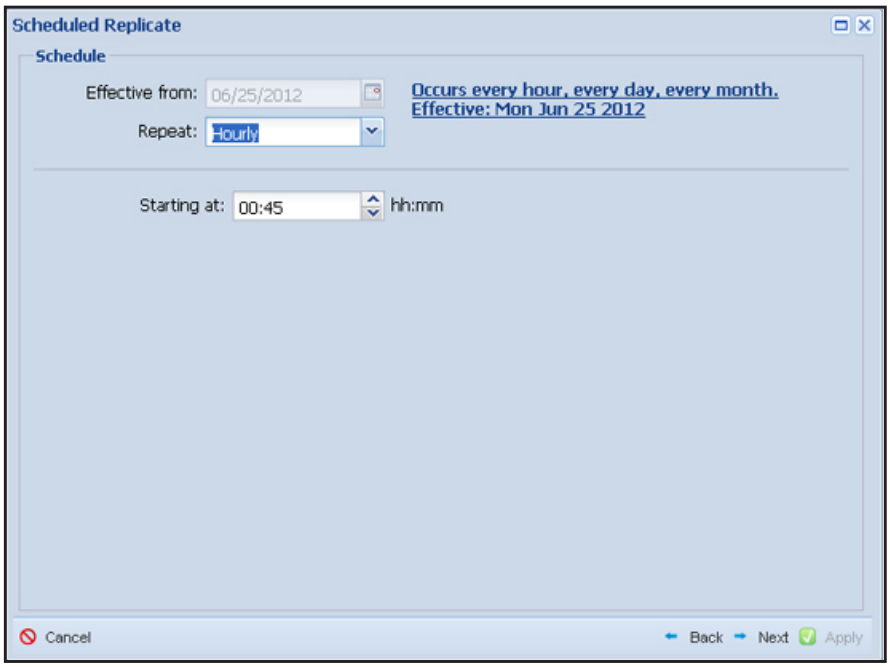
6. Configure the settings on the second screen as explained in the following table:

Item	Description	
New data set name	Enter a name for the share or LUN on the destination system.	
Advanced Settings for Data Transmission		
Compression	Select the check box to enable data compression during the data transfer. Then configure the compression rate. By default, compression is disabled. **Note:** After the data has been transferred, the data is not stored compressed unless it was already compressed on the source share or LUN.	
	Compression Ratio	Select the compression rate by making a selection from the drop-down list. You can select from 1 through 10, and unlimited. For example, 5 indicates that data is compressed five times.
Encryption	Select the check box to enable encryption. By default, encryption is disabled. **Note:** NETGEAR recommends that you encrypt sensitive data. **Note:** If you do not use an explicit destination IP address, data that is replicated over the Internet is automatically encrypted for increased safety. When you select the Encryption check box, data that is replicated over the Internet is encrypted twice.	

Item	Description	
Deduplication	Select the check box to enable deduplication during the data transfer. Deduplication prevents transfer of redundant data and increases the speed of the data transfer. **Note:** After the data has been transferred, the data is not stored in a deduplicated format unless it was already deduplicated on the source share or LUN.	
Explicit Destination IP Address	ReadyDATA Replicate automatically selects the physical Ethernet interfaces and VNICs for communication between the source and destination systems. If you want to use a specific interface on the destination system, you need to specify its IP address. To specify a specific interface, select the check box to enable an explicit destination IP address. Then configure the IP address. **Note:** You need to set up port forwarding if the source and destination are behind a firewall. **Note:** If you use an explicit destination IP address, data that is replicated over the Internet is not automatically encrypted. You need to select the Encryption check box to enable encryption.	
	IP Address	Enter the IP address of the interface on the destination system. The address is automatically appended with port number 6819.

7. At the bottom right of the screen, click **Next**.

   The third Scheduled Replicate screen displays:

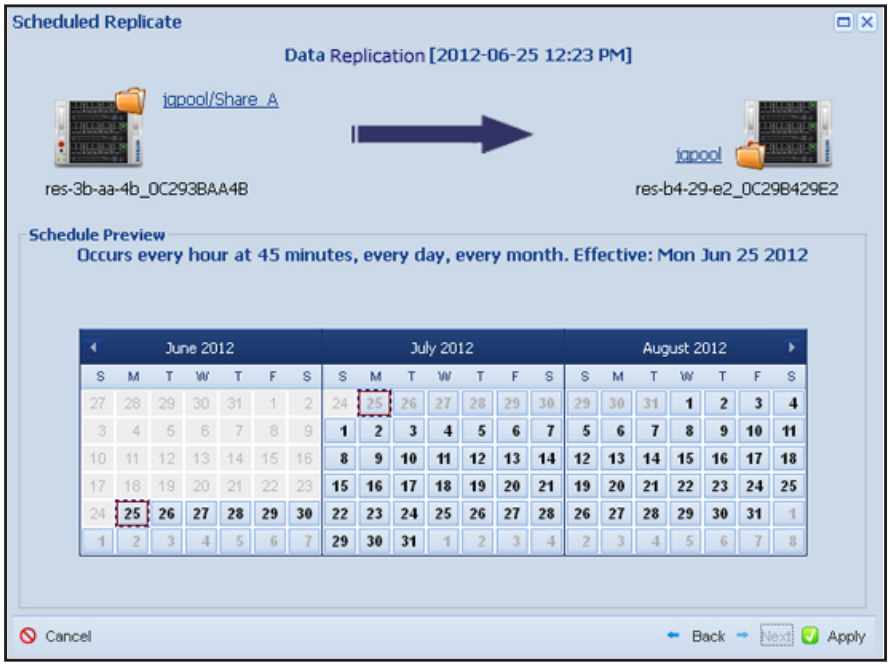


8. Configure the settings on the third screen as explained in the following table:

Item	Description
Effective from	This field is for information only. It states the date as of which the replication schedule is effective.
Repeat	From the Repeat drop-down list, select how replication is repeated: • **Hourly**. From the Starting at menu, select the time within the hour. • **Daily**. From the Starting at menu, select the hour and the time within the hour. • **Every weekday**. This option excludes Saturdays and Sundays. From the Starting at menu, select the hour and the time within the hour. • **Monthly**. From the Starting at menu, select the hour and the time within the hour, and select the day of the month. • **Custom**. Customize the replication pattern with hourly, daily, weekly, and monthly options. The screen adjusts according to the option that you select.
Starting at	From the Starting at menu, select the time at which replication starts. The options depend on your selection from the Repeat drop-down list: • For the Hourly option, select on the quarter hour, on the half hour, or on the three quarters of an hour. • For the Daily, Every Weekday, and Monthly options, select on the quarter hour, on the half hour, or on the three quarters of an hour, from 1 through 23.
on	For the Monthly option of the Repeat drop-down list only, select the day, from 1 through 30, on which replication starts.

9. At the bottom right of the screen, click **Next**.

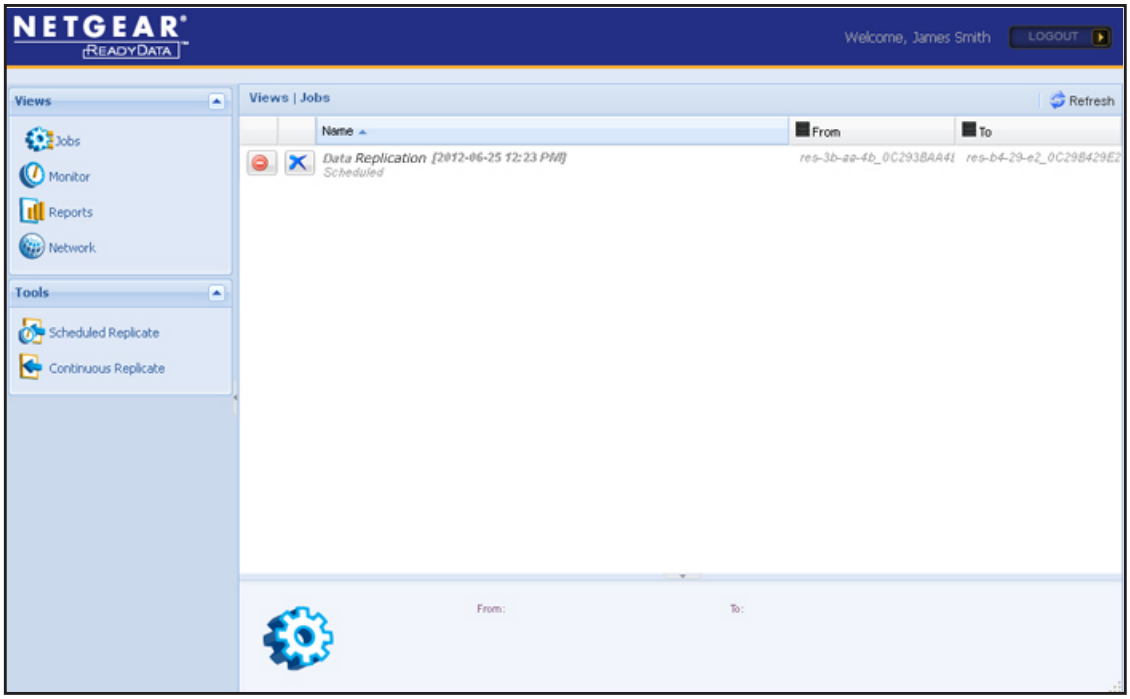
The fourth and final Scheduled Replicate screen displays:



This screen provides an overview of the configured replication schedule. If you need to change the schedule, click **Back**.

10. Click **Apply**.

    The Jobs screen displays, showing the replication configuration:



Configure Continuous Replication

Note: For full disaster recovery, configure continuous replication for each individual share and LUN.

WARNING:

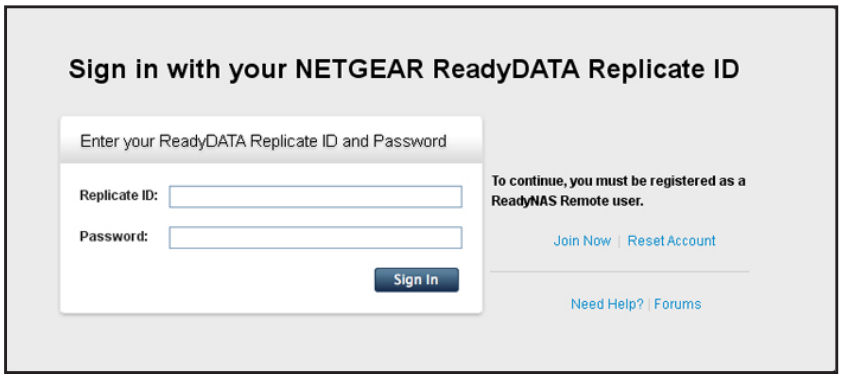
If you disable replication on a registered ReadyDATA, the system is deregistered from ReadyDATA Replicate, and the replication job is deleted. Make sure that replication remains enabled on a registered ReadyDATA that is part of a replication job.

After you have registered at least two ReadyDATA systems for ReadyDATA Replicate, you can schedule the replication of a share or LUN from one ReadyDATA to another.

➢ **To schedule continuous replication of a share or LUN:**

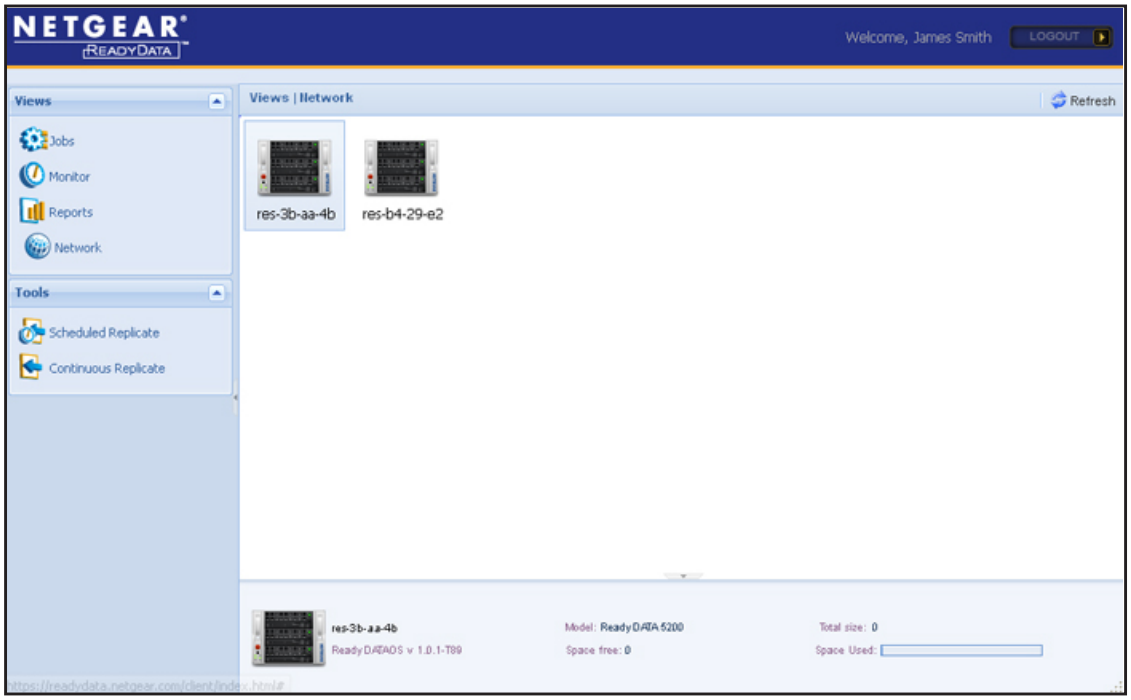
1. Go to *https://readydata.netgear.com*.

The access screen displays:



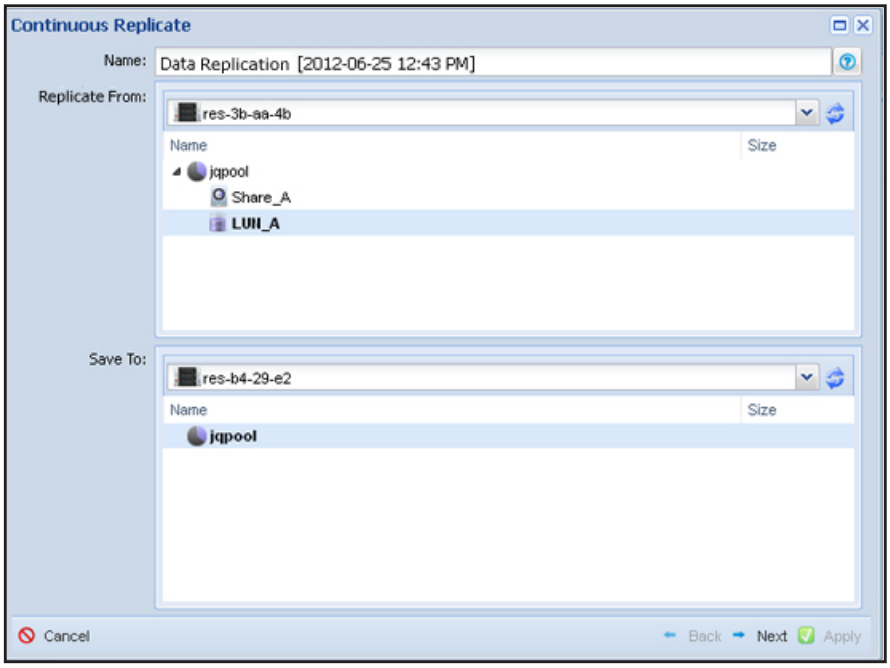
2. Sign in using your remote ID and password.

   The ReadyDATA Replicate Network screen displays:



3. From the Tools menu on the left, select **Continuous Replicate**.

The first Continuous Replicate screen displays:

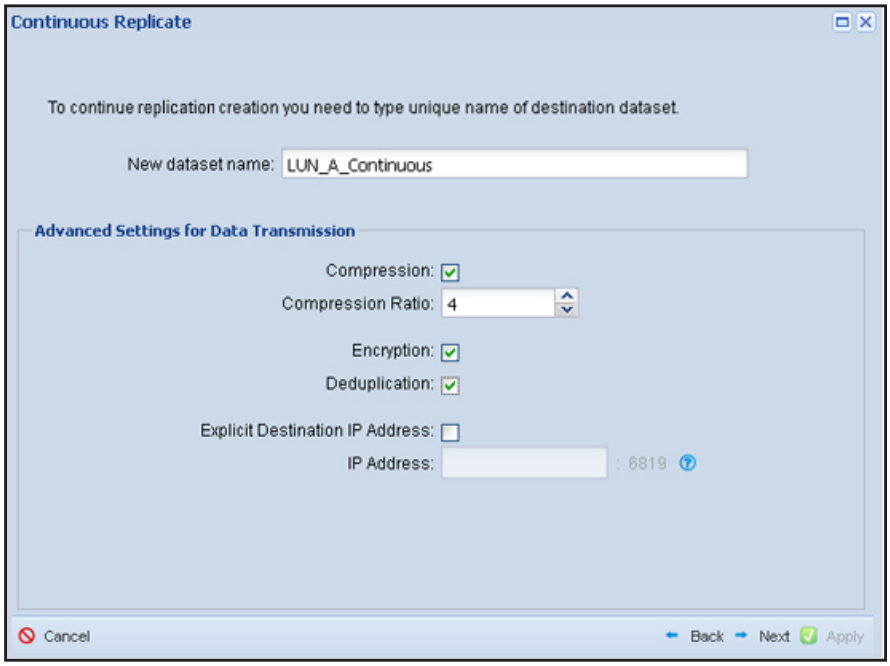


4. Configure the settings on the first screen as explained in the following table:

Item	Description
Name	Keep the default name for the replication schedule, or overwrite the default name with another name.
Replicate From	From the Replicate From drop-down list, select the ReadyDATA from which you want to replicate a share or LUN, that is, select the source system. Then make the following selections: 1. Select the volume on which the share or LUN resides. 2. Double-click the volume. 3. Select the share or LUN.
Save To	From the Save To drop-down list, select the ReadyDATA to which you want to replicate a share or LUN, that is, select the destination system. Then select the volume to which you want to replicate the share or LUN. **Note:** In the previous figure, the name of the volume to which the share or LUN is replicated is identical to the name of the volume from which the share or LUN is replicated. This is not a typical situation.

5. At the bottom right of the screen, click **Next**.

The second Continuous Replicate screen displays:



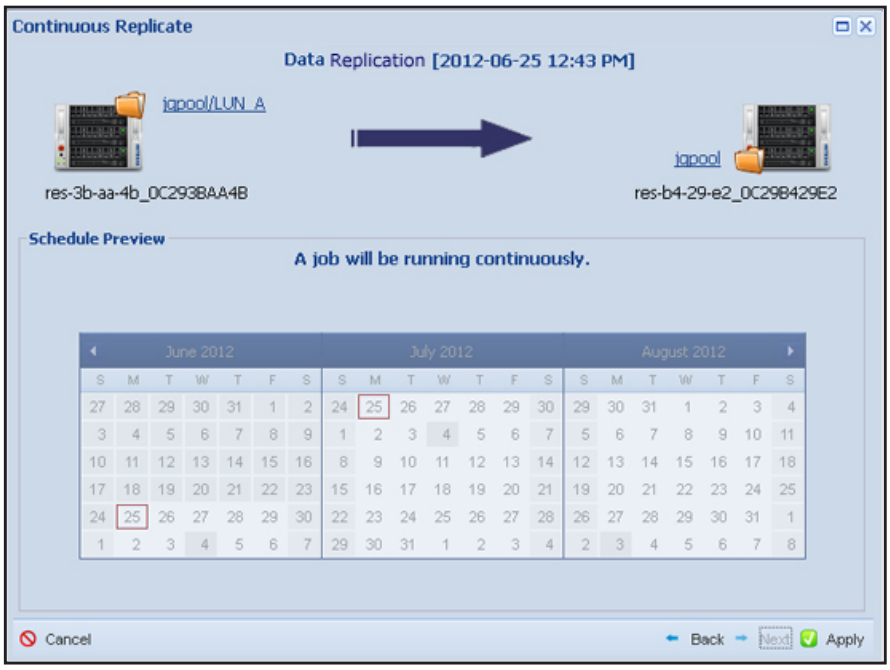
6. Configure the settings on the second screen as explained in the following table:

Item	Description	
New data set name	Enter a name for the share or LUN on the destination system.	
Advanced Settings for Data Transmission		
Compression	Select the check box to enable data compression during the data transfer. Then configure the compression rate. By default, compression is disabled. **Note:** After the data has been transferred, the data is not stored compressed unless it was already compressed on the source share or LUN.	
	Compression Ratio	Select the compression rate by making a selection from the drop-down list. You can select from 1 through 10, and unlimited. For example, 5 indicates that data is compressed five times.
Encryption	Select the check box to enable encryption. By default, encryption is disabled. **Note:** NETGEAR recommends that you encrypt sensitive data. **Note:** If you do not use an explicit destination IP address, data that is replicated over the Internet is automatically encrypted for increased safety. When you select the Encryption check box, data that is replicated over the Internet is encrypted twice.	

Item	Description	
Deduplication	Select the check box to enable deduplication during the data transfer. Deduplication prevents transfer of redundant data and increases the speed of the data transfer. **Note:** After the data has been transferred, the data is not stored in a deduplicated format unless it was already deduplicated on the source share or LUN.	
Explicit Destination IP Address	ReadyDATA Replicate automatically selects the physical Ethernet interfaces and VNICs for communication between the source and destination systems. If you want to use a specific interface on the destination system, you need to specify its IP address. To specify a specific interface, select the check box to enable an explicit destination IP address. Then configure the IP address. **Note:** You need to set up port forwarding if the source and destination are behind a firewall. **Note:** If you use an explicit destination IP address, data that is replicated over the Internet is not automatically encrypted. You need to select the Encryption check box to enable encryption.	
	IP Address	Enter the IP address of the interface on the destination system. The address is automatically appended with port number 6819.

7. At the bottom right of the screen, click **Next**.

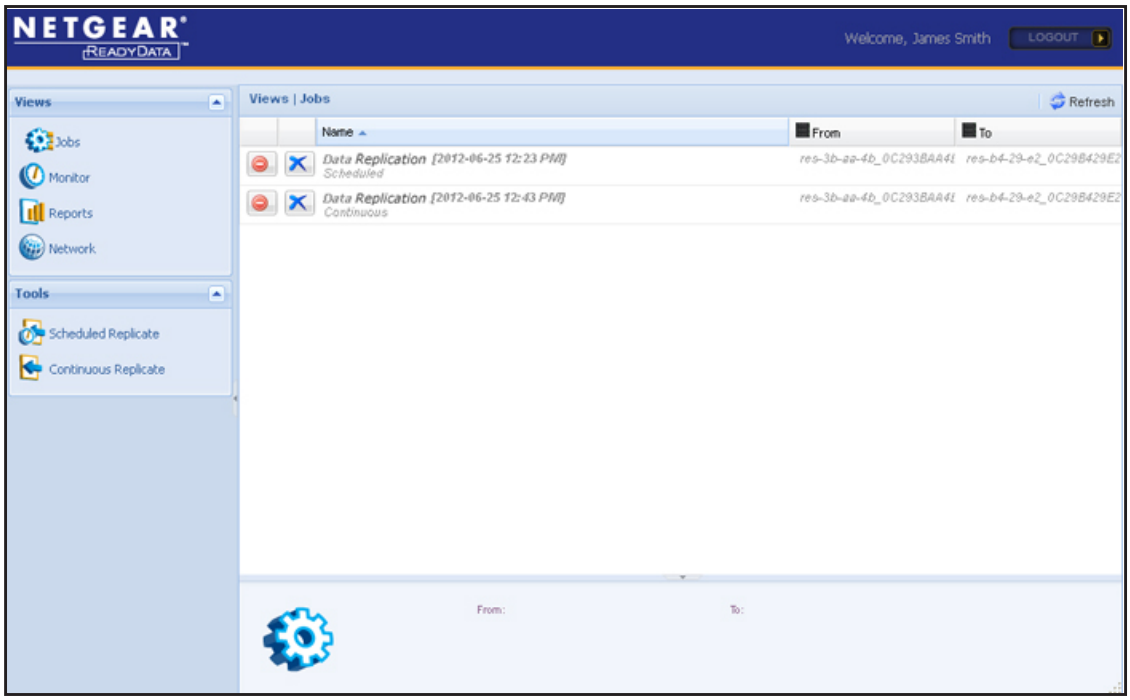
   The third and final Continuous Replicate screen displays:



This screen provides an overview of the replication configuration. If you need to change the schedule, click **Back**.

8. Click **Apply**.

   The Jobs screen displays, showing the replication configurations:



Recover Data

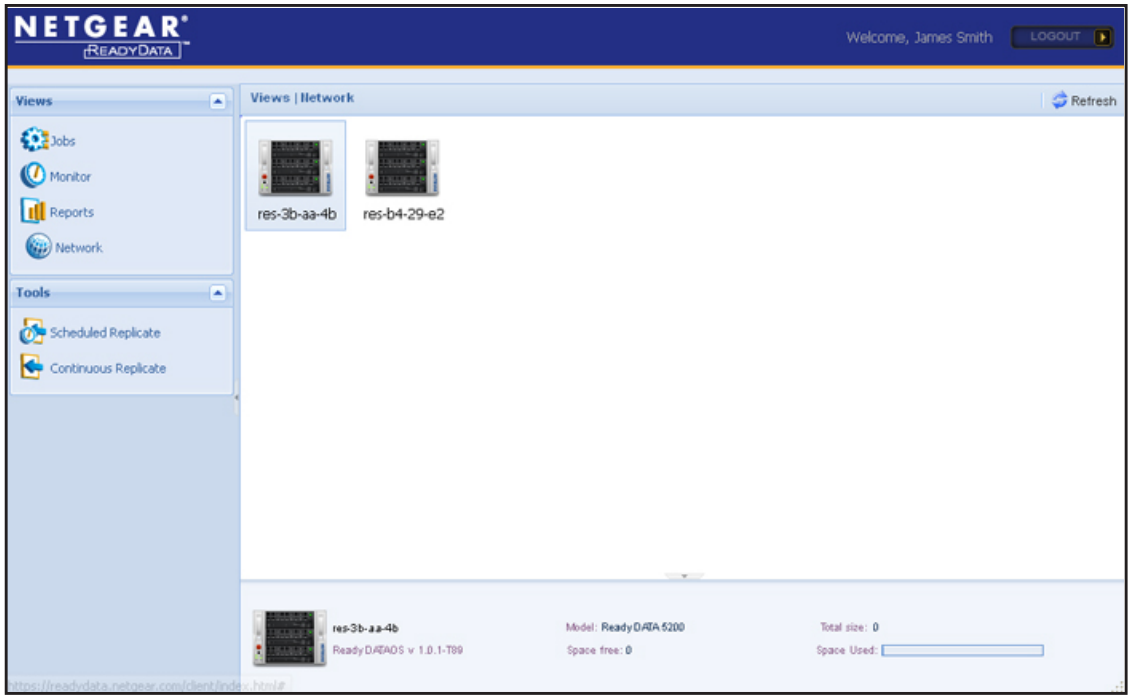
In a continuous replication configuration, after data has been lost at the source system, or after the source system has been compromised, there are no special steps to recover data.

Once you have configured continuous replication for each individual share and LUN on the source system, all data is available at the secondary location on the destination system. You simply provide users access to their share or LUN on the destination system.

After the source system has been repaired and brought back online, you have the option to configure reverse replication to replicate data from the destination system back to the source system.

View the Network

The Network screen graphically displays all the systems that are registered for replication and their status.



Double-click a system to display the host name and the volumes on the system. Double-click a volume to display the shares and LUNs on the volume.

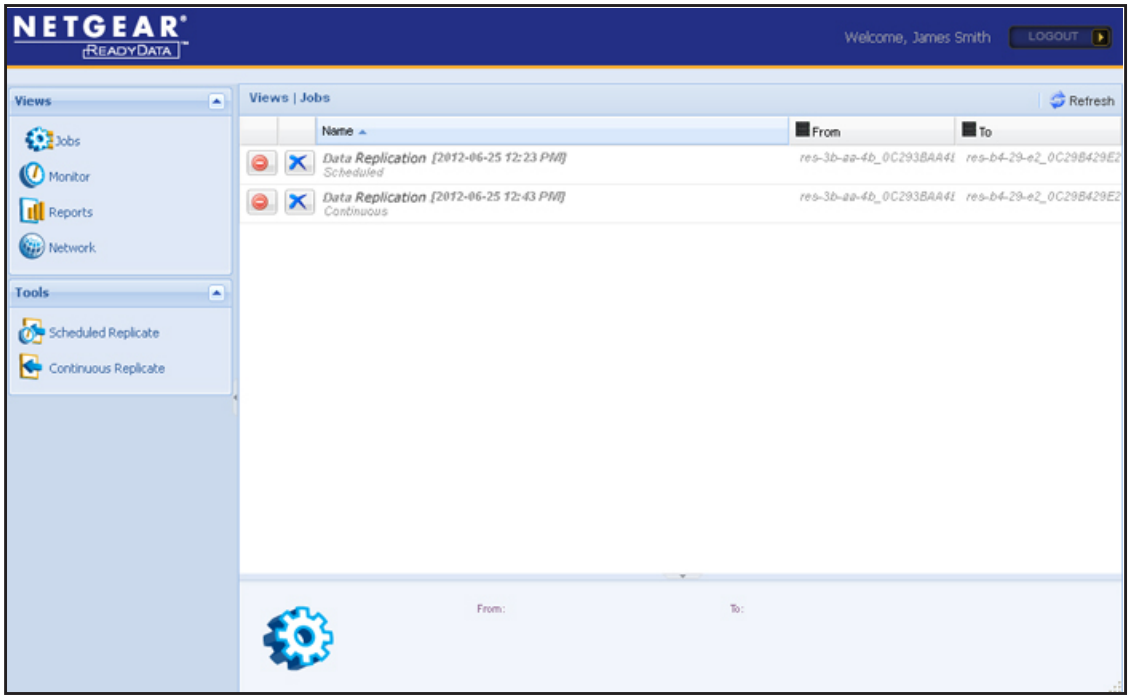
The bottom panel of the Network screen displays the following information:

- Host name
- ReadyDATA firmware version if the system is online. If the system is offline, *Offline* is stated.
- Device model
- Free space on the device
- Total size of all volumes on the device
- Total space used on all volumes on the device

Click **Refresh** to update the information onscreen.

View the Jobs

The Jobs screen displays the configured replication jobs, and lets you disable and delete jobs.



- **To disable or reenable a job:**

  Click the red icon (the stop sign) to the left of the job. To reenable the job, click the red icon again.

- **To delete a job:**

  Click the blue icon (the X) to the left of the job.

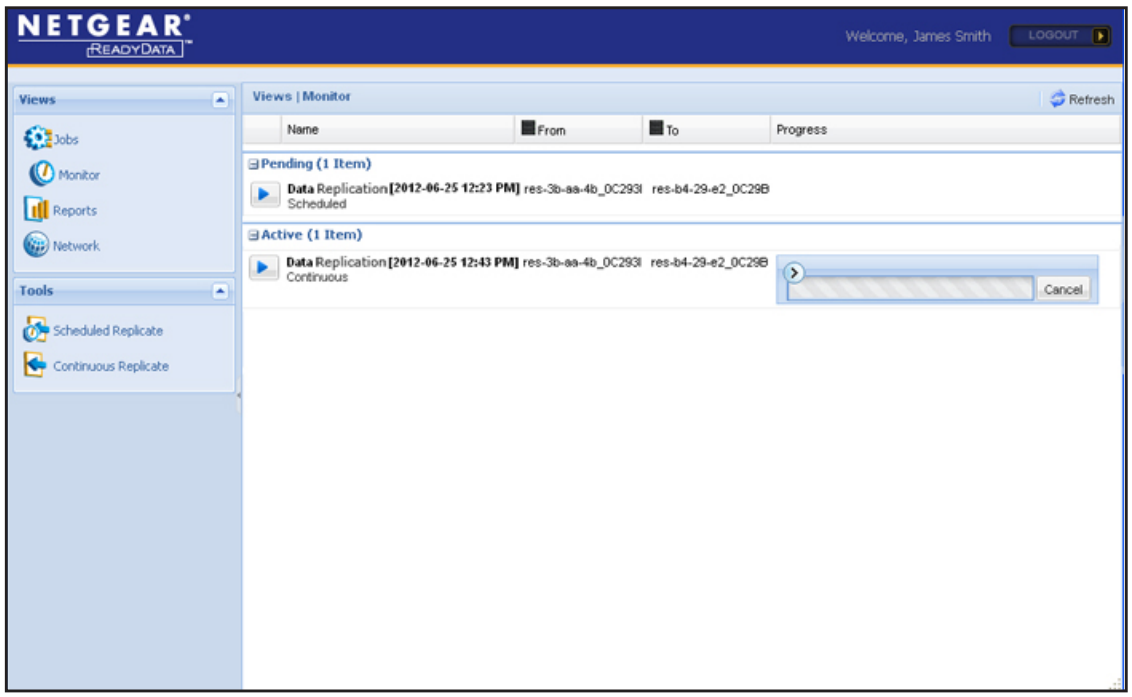
- **To reorganize the table with jobs and group the jobs:**

  To the right of a column heading in the table, click the drop-down list. You can do the following:

  - Sort the jobs in ascending order
  - Sort the jobs in descending order
  - Add or remove columns from the table
  - Click **Refresh** to update the information in the table.

Monitor the Jobs

The Monitor screen displays the status of pending and active jobs. Active jobs are currently running; pending jobs are the next occurrence of a scheduled replication job. You can also run a scheduled replication job immediately, and cancel an active job. Continuous replication jobs are always active jobs.

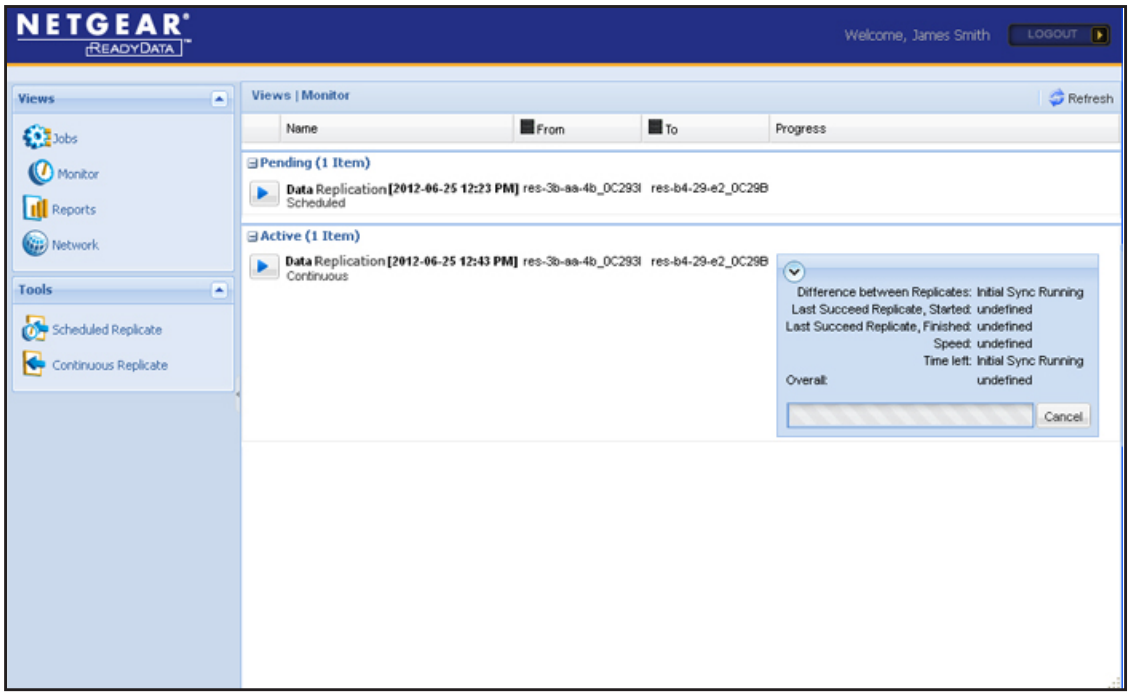


- **To run a job immediately:**

  Click the blue icon (the arrow) to the left of the job.

- **To display details about a job that is running:**

  On the status bar to the right of the job, click the greater-than icon. The status bar expands to displays details about the job:



- **To cancel a job that is running:**

  To the right of the status bar, click **Cancel**.

- **To reorganize the table with jobs and group the jobs:**

  To the right of a column heading in the table, click the drop-down list. You can do the following:

  - Sort the jobs in ascending order
  - Sort the jobs in descending order
  - Add or remove columns from the table

  Click **Refresh** to update the information in the table.

Run Job Reports

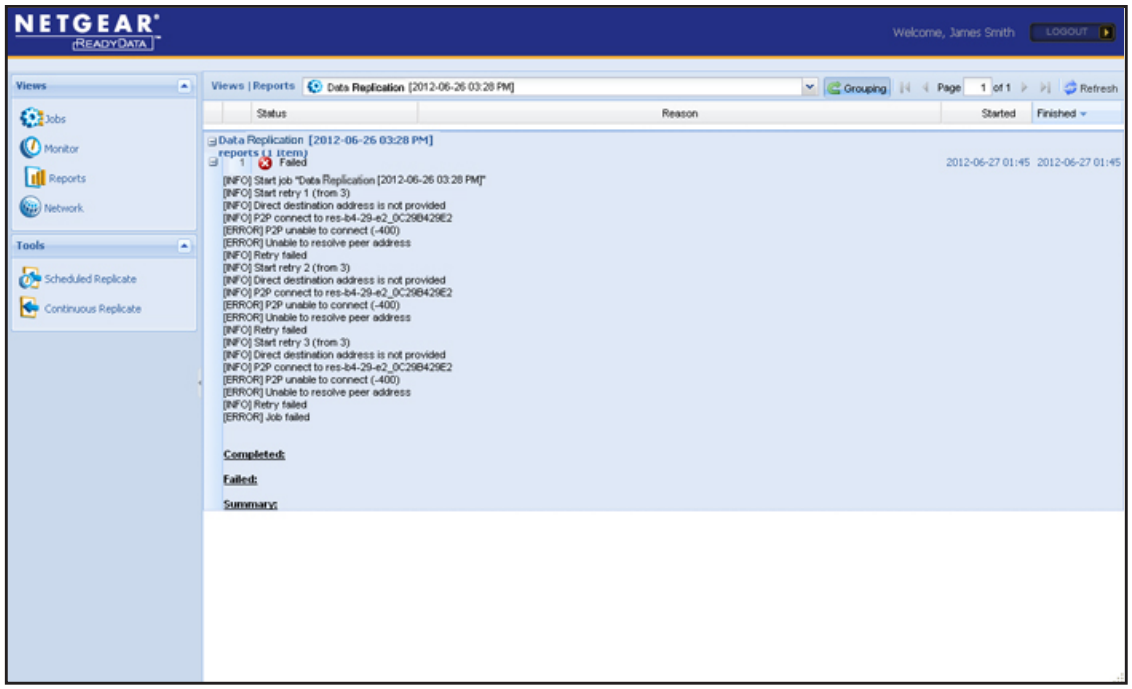
You can generate a report that shows the outcome of a scheduled replication job.

- **To run a report:**

  1. Select a job from the Report drop-down list.

     The report runs automatically, and generates a detailed progress report (seer the figure in *Step 2*).

  2. Click the **+** icon to the left of a job to display the details of the job. If a job fails, the report indicates where the problem occurred.



➢ **To reorganize the table with reports and group the reports:**

To the right of a column heading in a table, click the drop-down list. You can do the following:

- Sort the reports in ascending order
- Sort the report in descending order
- Add or remove columns from the table
- Group the reports by a field
- Show the reports in a group (you can also click the Grouping button above the table)

Click **Refresh** to update the information in the table.

Factory Default Settings

A

This appendix provides the factory default settings of the ReadyDATA.

To reset all settings to their factory defaults, use the procedure that is explained in *Reset the Firmware to Factory Defaults* on page 139, or press the **Reset** button on the front panel of the ReadyDATA s explained in the *ReadyDATA Hardware Manual*. The ReadyDATA returns to the factory configuration settings that are shown in the following table:

Table 11. ReadyDATA factory default settings

Item	Default Setting			
System settings				
Device Time	GMT -08:00 Pacific Time (US & Canada); Tijuana			
Services	SMB	Globally enabled		
	AFP	Globally enabled		
	NFS	Globally disabled		
	FTP	Globally disabled	Port number	21
			Authentication mode	Anonymous
			Allow upload resumes	Disabled
			Passive ports	32768–65535
			Masquerade address	Disabled
	SNMP	Globally disabled	Community	Public
			Trap destination	Blank
			Hosts allowed access	Blank
	SSH	Globally disabled		
	iSCSI	Globally enabled (nonconfigurable)		
	Replicate	Globally disabled	User name	Blank
			Password	Blank
Language	English			

Table 11. ReadyDATA factory default settings (continued)

Item	Default Setting		
Host name	RES- followed by the last 6 bytes of the system's primary MAC address		
Network settings			
Ethernet interface settings	MTU	1500	
	Speed (Mbps)	1000	
	Duplex	Full	
	Bonding	None	
	VNIC	One attached to each interface (for example, vnic0 to eth0 and vnic1 to eth1)	
VNIC settings	MTU	1500	
	VLAN ID	0	
	Bandwidth limit	None	
	TCP/IP	IPv4 with DHCP enabled, and IPv6 disabled	
	DNS	No server	
Storage settings			
Volumes	No default volumes	Compression	Enabled (nonconfigurable)
		Deduplication	Enabled (nonconfigurable)
Shares	No default shares	Logbias	Latency
		Compression	Disabled (configurable)
		Deduplication	Disabled (configurable)
		Protection	Continuous
		Protection interval	Daily
		Size	Unlimited access to the storage space on the volume, assigned on demand
		Access	Denied until you set permissions

Table 11. ReadyDATA factory default settings (continued)

Item	Default Setting		
LUNs	No default LUNs	Logbias	Latency
		Compression	Disabled (configurable)
		Deduplication	Disabled (configurable)
		Protection	Continuous
		Protection interval	Daily
		Provisioning	Thick
		Access	Denied until you set permissions
Snapshots	Hourly	On the hour	
	Daily	At midnight	
	Weekly	At midnight on Friday	
Security settings			
Administrative settings	User name	admin	
	Password	password	
	Password recovery	Question	Blank
		Answer	Blank
		Email address	Blank
Authentication	Access type	Local users	
	Workgroup name	VOLUME	
	Default groups	*users* with GUID *100*	
	Default users	None	
SAN settings			
LUN groups	No default group	Target	Automatically issued
		CHAP authentication	Disabled
		Initiators	None
		Bidirectional CHAP authentication	Disabled
System monitoring			
Alerts	Disabled (email, user, and server information is blank)		
	Event types	All event types are enabled	

Table 11. ReadyDATA factory default settings (continued)

Item	Default Setting		
Logs	Records	Errors enabled Warnings enabled Info enabled	
	Categories	All (System, Disk, Volume, Share, Account, and Miscellaneous)	
Status graphics	Volume	Volume	All volumes
		Type	Operations
		Period	5 minutes
		Update	5 seconds
	Network	Network	All Ethernet interfaces and VNICs
		Protocol	All (SMB, NFS, AFP, HTTP, SSH, iSCSI, and SNMP)
		Period	5 minutes
		Update	5 seconds
	Utilization	Volume	All volumes
		Period	5 minutes
		Update	5 seconds
	Temperature	Temperature	All (SYS, CPU, and AUX)
		Period	5 minutes
		Update	5 seconds

Notification of Compliance

B

NETGEAR Wired Products

Regulatory Compliance Information

This section includes user requirements for operating this product in accordance with National laws for usage of radio spectrum and operation of radio devices. Failure of the end-user to comply with the applicable requirements may result in unlawful operation and adverse action against the end-user by the applicable National regulatory authority.

This product's firmware limits operation to only the channels allowed in a particular Region or Country. Therefore, all options described in this user's guide may not be available in your version of the product.

Europe – EU Declaration of Conformity

Products bearing the CE marking comply with the following EU directives:

- EMC Directive 2004/108/EC
- Low Voltage Directive 2006/95/EC

If this product has telecommunications functionality, it also complies with the requirements of the following EU Directive:

- R&TTE Directive 1999/5/EC

Compliance with these directives implies conformity to harmonized European standards that are noted in the EU Declaration of Conformity.

FCC Requirements for Operation in the United States

FCC Information to User

This product does not contain any user serviceable components and is to be used with approved antennas only. Any product changes or modifications will invalidate all applicable regulatory certifications and approvals

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Guidelines for Human Exposure

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

FCC Declaration Of Conformity

We, NETGEAR, Inc., 350 East Plumeria Drive, San Jose, CA 95134, declare under our sole responsibility that the ReadyDATA complies with Part 15 of FCC Rules.

Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

FCC Radio Frequency Interference Warnings & Instructions

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following methods:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an electrical outlet on a circuit different from that which the radio receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Modifications made to the product, unless expressly approved by NETGEAR, Inc., could void the user's right to operate the equipment.

Canadian Department of Communications Radio Interference Regulations

This digital apparatus, ReadyDATA, does not exceed the Class B limits for radio-noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

This Class [B] digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe [B] est conforme à la norme NMB-003 du Canada.

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